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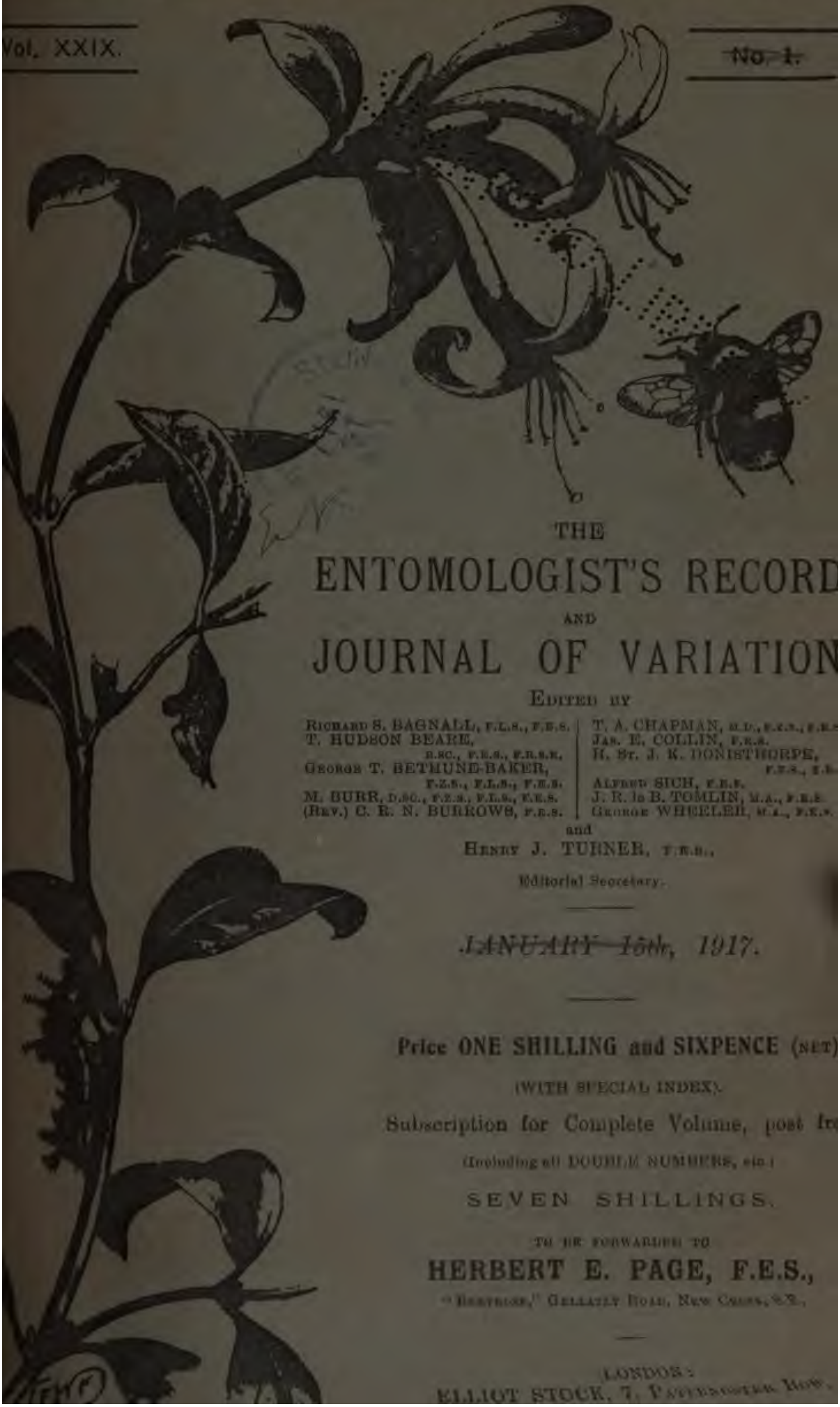

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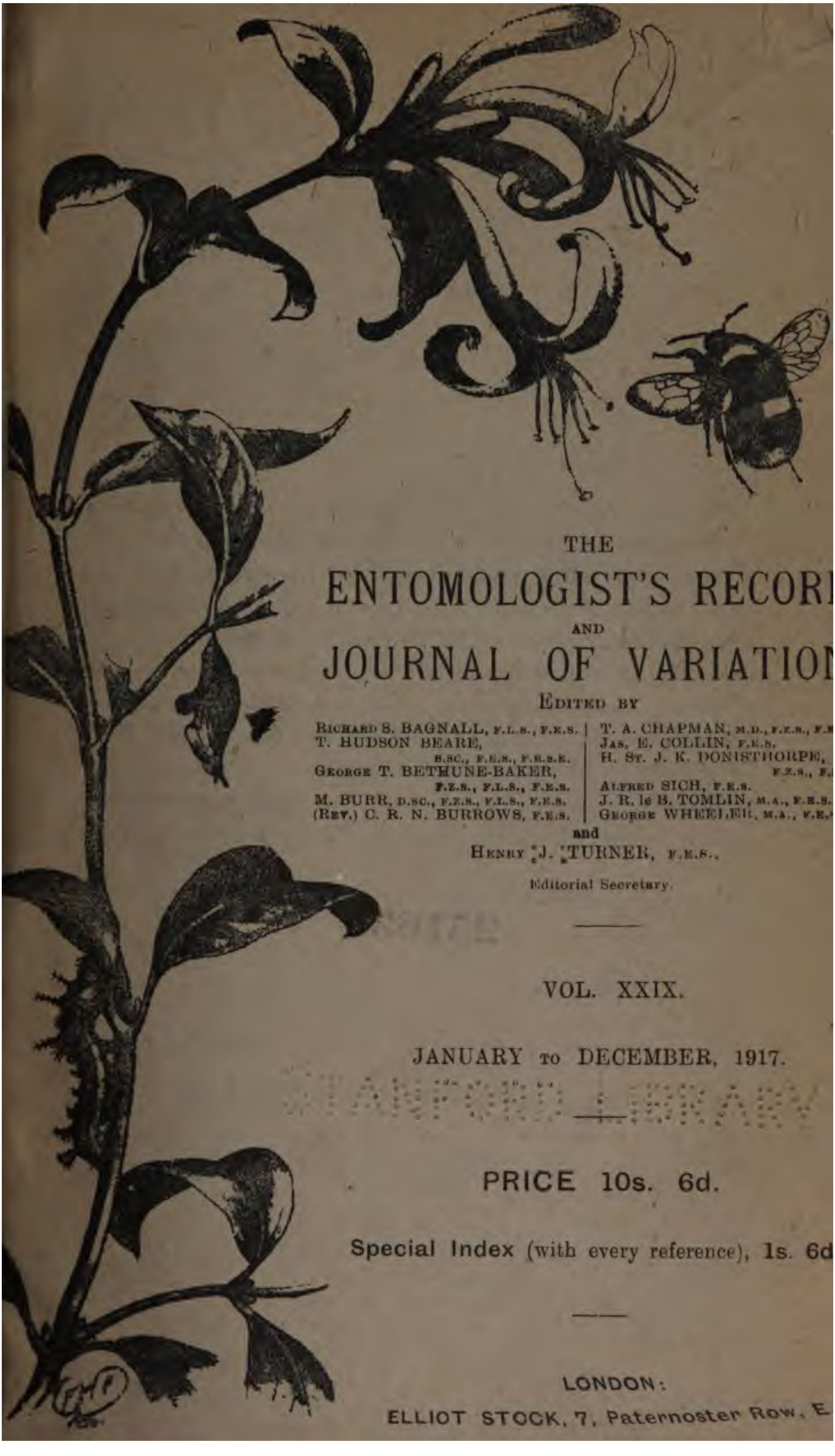

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We heartily welcome Mr. J. H. Durrant as a colleague in the new year. He has generously helped us much in the past without recognition, and now we are assured of him as "one of us."

In the January number we hope, through the kindness of Dr. Chapman, to have six plates to illustrate an article on the Plebeiids. Various other interesting and useful items have been promised for the coming year.

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H.J.T.

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Coleoptera arranged in order of Genera. The other orders arranged by Species. Species, Genera, etc., new to Britain are marked with an asterisk, those new to Science with two asterisks.

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CORRIGENDA.

Most of the errors in the spelling of scientific names have been corrected in the Special Index.

Page 17, line 41. For ARAGONENSIS read ARRAGONENSIS.
,, 41, ,, 7. For 71 read 714.
,, 39, ,, 3. After *page 158* add *vol. xxviii.*
,, 64, ,, 14. For *L.* read *Boarmia.*
,, 65, ,, 3. For OCCURRANCE read OCCURRENCE.
,, 91, ,, 12. After "Natural" add "History."
,, 98, ,, 25. For *enaspis* read *euaspis.*
,, 99, ,, 33. For *laccinatus* read *laticinctus.*
,, 105, ,, 46. For *biatomae* read *biatomella.*
,, 105, ,, 47. For *salicella* read *salaciella.*
,, 110, ,, 1. For "chulk" read "chalk."
,, 111, ,, 24. For *ignata* read *ignita.*
,, 111, ,, 24. For *rudii* read *ruddii.*
,, 113, ,, 37. For *Ectatoma* read *Ectatomma.*
,, 231, = page 131.
,, 232, = page 132.
,, 133, line 50. For 102 read 1902.
,, 142, ,, 10. Insert a comma after "seen."
,, 150, ,, 10. Insert [before "These."
,, 150, ,, 12. Insert] after "moment."
,, 165, ,, 13. For "alls" read "all's."
,, 169, ,, 15. For *carniculatus* read *corniculatus.*
,, 169, ,, 18. For *Sesia* read *Aegeria.*
,, 182, ,, 44. Herefordshire read Hertfordshire.
Plate IV., figs. 17 and 18, for *lapidella* read = *ferchaultella.*

The Entomologist's Record

AND

JOURNAL OF VARIATION.

Vol. XXIX. No. 1. January 15th, 1917.

The Races of Agriades coridon inhabiting the Albarracin Sierra and its vicinity.

By W. G. SHELDON, F.E.S.

In his paper in the November number of this magazine Dr. Chapman raises the question whether the two races of *Agriades coridon* occurring in this district interbreed, and mentions that since his visit there intermediate forms have been taken by myself; he further says, "they are in any case so rare that I came across none of them. Were the two forms one species, they ought to weld into one form with only occasional aberrations approaching the present extreme forms."

To take first Dr. Chapman's point of their rarity. At the time of my visit in 1905 intermediates between the two forms were not by any means rare.

My companion, Mr. E. F. S. Tylecote, and myself reached Albarracin on July 26th, and stayed until August 6th. On our arrival we found that Miss Fountaine had been staying in the town for several weeks, and she did not leave until considerably after the date of our departure.

Agriades coridon var. *arragonensis* was abundant and in good condition during the whole of our stay, in two localities in the vicinity of Albarracin; one of these was in the Guadalaviar Gorge, some five kilometres on the road leading to Teruel; and the other was the hill district known as Puerta de la Losilla, four kilometres south of the town. Flying with swarms of typical *arragonensis*, mixing freely with them, and easily distinguishable on the wing by their colour, were certain males, the depth and tint of blue of which agreed closely with typical *A. coridon;* they had, however, the light outer margins to the wings, with the ocelli showing on the upper side, which obtains in the majority of typical var. *arragonensis.* I have two of these forms, and I caught and rejected others that were damaged. Mr. Tylecote captured some, and Miss Fountaine at the date of our arrival had two or three examples, and I saw her afterwards release at least one imperfect one.

All my specimens of this form were taken at La Losilla, and I think Mr. Tylecote's were also, but certainly one or two of Miss Fountaine's were met with in the Guadalaviar locality. Altogether there must have been ten or a dozen examples of this form seen or captured by the three of us.

In addition to the above described forms, there was quite a number of males which were intermediate in colour between them and typical var. *arragonensis*. Of the three or four dozen male *A. coridon* that I brought away from Albarracin, speaking from memory, I should say that these were about a dozen in number; I have several of them at present in my series.

Of the typical var. *hispana* only one example was met with in the neighbourhood of Albarracin by the three collectors. This was taken by myself, alongside the banks of the Guadalaviar, about one kilometre nearer Albarracin than the locality for var. *arragonensis*, on August 4th. Its behaviour was very different from that which is usual with the species, which generally flies backwards and forwards over a very limited extent of ground, frequently settling on flowers. It was flying swiftly, at a height of several feet, down the gorge towards the *arragonensis* locality, not hesitating in any way, nor stopping at flowers or other attractions; it impressed me at the time as behaving like an insect that was impelled by some migratory instinct, or one that had lost its parent colony and was anxious to find another as soon as possible. It is not by any means a fresh specimen, and the left inferior is torn and has a portion missing.

With regard to Dr. Chapman's second point, that were the two forms one species they ought to weld into one form with only occasional aberrations. This would I think depend upon circumstances. If there are two colonies occupying practically the same ground, the individuals of one colony mingling and pairing freely with those of the other, one would expect that in the process of time one form would become common to both colonies, but if there are colonies of the two forms some little distance apart, and they do not mingle freely—and of course *A. coridon* is a species which has colonies over an extent of an acre, or even less, and one can find them abundant in this area year by year, whereas there is hardly a specimen to be found outside this area for a distance of many miles—but occasional examples of one form mingle and pair with the opposite sex of the other form, then I should expect to see a limited number of intermediates; and if the two forms were one species, and fertile, then I should expect to find specimens exhibiting characters between the intermediate and the prevalent form, which would be the result of further crossings.

Now let us see what evidence there is in support of the view that the specimens taken by Miss Fountaine, Mr. Tylecote, and myself, at Albarracin, which were intermediate in colour between var. *arragonensis* and *hispana*, were the results of crossing between the two forms. I think that without any other evidence than the laws of probability, there is strong reason to believe they were. However, there is I think very good evidence in support of my contention which has been supplied by Dr. Chapman himself.

In his account of the expedition which he made to the Albarracin district in 1901, he says (see *Ent. Record*, vol. xiv., p. 119), "The two forms of *A. corydon* taken, the violet coloured form *corydonius* (= var. *hispana*), and the pale var. *hispana* (= var. *arragonensis*), are very distinct, and no intermediate specimens were observed. They occurred on the same ground to some extent at Albarracin, *but in reality they* *occupied distinct areas*, and the cases of their occurring on the same ground was of the nature of overlapping."

This seems just the condition likely to produce occasional crossings and consequent intermediates between the forms of one species.

Dr. Chapman, in his article quoted above, notes that var. *arragonensis* was found on limestone, whereas var. *hispana* was not. It is true that Puerta de la Losilla, where I think both forms were met with by him, is not strictly speaking on limestone, which has in the neighbourhood a cap of red sandstone, but in places this rock is worn very thin by the action of water, and I noticed in one or two spots the limestone plants were abundant.

My own experience was very similar, var. *arragonensis* was only found amongst limestone plants, var. *hispana* on the contrary—with the exception of the one wandering example before noted – was confined to an igneous stratum, the exact nature of which I am not certain.

I found it abundant on the hills to the west of the village of Noguera, which is situated some fifteen miles west of Albarracin. The vegetation here was entirely different from that of the limestone formation on which var. *arragonensis* is found, and included vast thickets of *Cistus ladaniferus*, in the clearings between which var. *hispana* occurred freely. Its headquarters was a sunny slope of perhaps two or three acres, about two miles from the village; here these beautiful creatures were flying in hundreds, and one could catch a dozen or so with a sweep of the net.

It may perhaps be said, if there were intermediates between *hispana* and *arragonensis* in the vicinity of Albarracin in 1905, how was it that there were none observed in 1901? and if *hispana* was not infrequent in 1901 how was it that (with the exception of a single wanderer) it was not seen in 1905? To which I would reply, that I think it probable we did not tap Dr. Chapman's locality in which he found *hispana* and *arragonensis* frequenting adjoining ground but keeping apart; or his colony of *hispana*, presumedly a weak one, may have died out so far as pure specimens were concerned, and have only been represented by intermediates, the results of crossings in previous years. It is of course possible that there had not been any crossings the year previous to 1901, or that there were for other reasons not any intermediates in evidence in that year.

Lying before me as I write is a geological map of the district I am discussing. It shows a remarkably diverse arrangement of the strata, and I cannot help thinking that there must be a strong colony, and probably several, of *hispana*, in the neighbourhood, at present undiscovered, and which was the source of the small numbers of that form which have been seen or captured.

Lepidopterology.*

By T. A. CHAPMAN, M.D., F.E.S.

This volume is in quarto, no doubt owing to the exigencies of having plates large enough to show of natural size the gigantic moths it treats of, *viz.*, 9½ inches (*Xyleutes*) and 11 inches (*Coscinocera*) in expanse.

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* Études de Lépidoptèrologie Comparée, Fasc. XIbis. Contributions à l'étude des Grands Lépidoptères d'Australie (Genres *Coscinocera et Xyleutes*) par Charles Oberthür, Constant Houlbert, et F. P. Dodd.

There is a short note by Mr. F. P. Dodd on "Noise producing Lepidoptera" (of Australia), a number of which are the pupæ of myrmecophilous Lycaenids. There follows a notice of *Coscinocera hercules*, by Monsieur Oberthür. The species was first described by Miskin, in the "Proc. and Trans. of the Ent. Soc. Lond.," in 1875 and 1876. This is illustrated by full size photographs of the moths, one of which, a female, is eleven inches in expanse. Another, a male, has three antennæ, in connection with which is a photograph of a three-antennæd specimen of *Doleshallia amboinensis*. There are also photographs of the enormous larvæ of *C. hercules* (by F. P. Dodd), they are 5½ inches long and a full inch in thickness.

Then follow biological notes on *C. hercules* and on Australian *Cossidae*, by Mr. Dodd. Amongst other items is a record of a ♀ of *C. hercules* placed on a shrub, which remained unattended for two days, but on the third morning she was connected to a fine large male and another closely in attendance. The first male separated in the afternoon, the second was connected the following morning and remained so for 24 hours. There are photographs of these insects on these two mornings, of the three, then two moths. These remarkable facts are well reported and well illustrated.

Mr. Dodd's notes on the *Cossidae* show that Brisbane is very rich in this group. It appears that the natives, who esteem the larvæ much as food, keep the species in check, but where there are no natives now, they tend to increase so as to be destructively abundant. The natives, however, shrink from the labour of extracting the larvæ from solid timber when other food is abundant.

He says that the great longevity of these larvæ is a mere Munchausen tale, that no species exceeds three years as a larva, and two is the most usual length of life in most species. There is a detailed life-history of *Xyleutes boisduvali*, with notes on other species; a remarkable fact is that if the food fails from the death of the tree or other cause, the insect pupates and emerges though only one-third grown, the moth expanding 2½ inches instead of 6 or 7,

There are seven photographs of country and scenery about Kuranda in the Cairns district. M. Oberthür next describes three new species of *Xyleutes*, with notes on other species. M. Oberthür dedicates one new species, *X. mackeri*, to the son (Lieut.-Col. Leon Macker, killed at Verdun) of his dear old friend Docteur Emile Macker, Vice-President of the Natural History Society of Colmar. A record of the battles at the Bois de Corbeaux, in which Colonel Macker was killed, from the *Nouvelliste de Bretagne*, is added. In addition to these new species are notes on a number of others, illustrated by twenty-five photographic plates.

These strike me as being the perfection of photographic representation (without colour). The insects presenting combinations of dark and light shades, without bright colours, are almost as effectively shown as if colour were added.

Part vi. is on the geographical distribution of *Xyleutes*, and descriptions of seven new species by Prof. C. Houlbert. This consists of some 65 pp., with many text figures. The *Cossidae* are a very ancient family, *Xyleutes* is more closely related to *Zeuzera* than to *Cossus*, both by the ♂ antennæ and the neuration. Prof. Houlbert groups *Xyleutes* into the Australian, the Indo-Malayan, the African and American sections.

This forms a basis for considering their birth place and their migrations during the geological time illustrated by three maps, showing their present distribution and the probable routes of dispersal in the Triassic and Jurassic periods. The Australian species form the typical genus *Xyleutes*, these originated in Australia and developed there. To explain the migrations we must accept the ancient Southern Continent of Gondwana, at the beginning of the Secondary period. There were at least three primitive centres of dispersion, Australia, Insulindia and Lemuria. This, with the generic groupings arrived at, show that in reality the *Xyleutes* have a polyphyletic origin. Their spread was already complete in tertiary times. In this it is difficult to accept literally the statement that the origin of *Xyleutinae* is polyphyletic, and we doubt if Prof. Houlbert means this, though he says so in so many words, his real meaning we take to be that the ancestors of the family, already *Xyleutinae*, spread over the Gondwana Continent, and the several groups he recognises developed thereafter, of course separately.

The essay is founded on a large amount of material in the Oberthür collection, and shows much thoughtful study. He gives a systematic catalogue of the tribe, showing 72 species. His new genera are largely compounds of *Cossus* (*Melanocossus*, *Neocossus*, etc.), though why *Cossus* after considering *Xyleutes* to be nearer *Zeuzera* than *Cossus*, is not very clear.

The Coloration Problem. II.

By W. PARKINSON CURTIS, F.E.S.

(Continued from vol. xxviii., page 246.)

The record for 1916 is meagre; this must be explained at once. I had much less opportunity than usual for observation, the institution of summer time having the effect of entirely spoiling my before breakfast outings, we had a number of disastrous fires on our best hunting grounds, due to incendiarism, and we had an opportunity not to be missed of studying the habits of two non-insectivorous birds under exceptionally favourable circumstances, the record, however, carried up to September 30th, 1916. In some cases below I have set out the times of the visits where I considered they were of importance, in other cases I have condensed the account as much as possible. My reason for giving the details will appear more fully in the arguments which will occupy the third section of my remarks.

The evidence.

The times given are mean solar time in every instance.

1. **Corvus monedula, L.** The Jackdaw.
Corvus frugilegus, L. The Rook.

Observer.—W. P. Curtis and Laura M. Cook.
Time.—Evening.
Sex.—?
Date.—May 27th and 28th, 1916.
Duration.—About one hour.
Place.—Rew Down, Isle of Wight.
Food.—Large crowds of birds came up from the rookeries and the

cliffs just after sundown on to the top of the Downs, but I was unable to find out what they came up for. The second evening, however, we got into close proximity to one of the crowds, and Miss Cook called my attention to the antics of the birds as they walked. We stayed to watch them. The actions, which were quite grotesque, being a Corvine attempt to emulate the airy feats of the *Motacillas*, were due to the efforts of the bird to catch *Hepialus lupulinus*, as it buzzed amongst the short grass. They seemed pretty successful as long as the insect kept moving, but were nonplussed directly it sat down. The careful way the birds scrutinised the resting place was most interesting. The birds made exceedingly short work of the insects, treating them like oysters and swallowing them wings and all at a gulp. Their appetites are notoriously voracious, but the matter-of-fact way they kept at the slaughter of the "Swifts," as long as they could see them, was astonishing. This, of course, accounted for the congregations of the previous evening.

[Note.—On the whole I think this is a valuable observation. We had the birds as close as 30 yards. I could see the iris of the bird's eyes quite distinctly. I could see the moths quite distinctly, so distinctly that even had I not known that *H. lupulinus* was flying in thousands I could have identified it with certainty at the distance. I estimated the number of Rooks and Jackdaws in the four acres or so of clear around us at 350, but probably that was an under estimate. It is very difficult to estimate and impossible to count. I would remark on this, that I am absolutely positive of the identity of captors and of captures, and I particularly call attention to the fact that when the *H. lupulinus* sat down the birds had great difficulty in seeing them. Speaking for myself, I have found that *H. lupulinus* sitting low down in grass is very hard indeed to see, and I might add that though I knocked down and examined a number there were none of the white *fusca* form amongst them. The Downs at this point are well covered, and do not exhibit the customary bare patches.]

2. **Sturnus vulgaris, L.** The Starling.

Observer.—E. H. Curtis. Time.—?
Date.—June 1st, 1913. Sex.—?
Place.—Berewood, Dorset. Duration.—Casual.

Food.—Flies (species ?). He caught one big fly and beat it on the ground, but picked it up and took it further away every time I tried to get near enough to identify it.

3. **Chloris chloris, L.** The Greenfinch.

Observer.—W. P. Curtis. Time.—a.m.
Date.—June 5th, 1914. Sex.—♂ and ♀.
Place.—Owslebury, Winchester. Duration.—2 hours.
Food.—Feeding young at nest. 5 times by regurgitation.

Observer.—W. P. Curtis. Time.—a.m.
Date.—June 6th, 1914. Sex.—♂ and ♀.
Place, Owslebury, Winchester. Duration.—2 hours.
Food.—6 times by regurgitation.

[Note.—The regurgitated food was a white pappy mixture like chewed oatmeal, it was impossible to say quite what it was, but I do not believe it was insect food at all.]

4. **Passer domesticus, L.** The Sparrow.

OBSERVER.—E. H. Curtis. TIME.—?
DATE.—June 15th, 1913. SEX.—?
PLACE.—Poole. DURATION.—Casual.

FOOD.—*Cabera exanthemata.* The insect was let out of a breeding cage, promptly pursued through three rows of sweet peas and a row of chrysanthemums, captured and carried off; a most pertinacious pursuit.

OBSERVER.—E. H. Curtis. TIME.—?
DATE.—June 18th, 1913. SEX.—?
PLACE.—Poole. DURATION.—Casual.

FOOD.—A similar occurrence, but the bird was infinitely quicker.

OBSERVER.—W. P. Curtis. TIME.—5.35 p.m.
DATE.—July 12th, 1913. SEX.—?
PLACE.—Bournemouth. DURATION.—Casual.

FOOD.—Hunted a Geometer out of a hedge, caught it and ate it. The insect was at rest, and, as near as I could tell at the distance, *Rumia luteolata.*

OBSERVER.—W. P. Curtis. TIME.—6.15 p.m.
DATE.—July 23rd, 1913. SEX.—?
PLACE.—Bournemouth (Central Station). DURATION.—10 minutes.

FOOD.—Caught five or six flies (*Musca* sp.?) which were walking on the glass of the station roof.

OBSERVER.—W. P. Curtis. TIME.—8.30 a.m.
DATE.—July 24th, 1913. SEX.—?
PLACE.—Poole Station. DURATION.—10 minutes.

FOOD.—A similar observation.

OBSERVER.—W. P. Curtis. TIME.—5 to 6 p.m.
DATE.—July 31st, 1913. SEX.—Many of both sexes.
PLACE.—Bournemouth and Poole. ——

FOOD.—Catching the winged individuals of ants, which were swarming (*Lasius niger ?*).

OBSERVER.—W. P. Curtis. TIME.—9.5 a.m.
DATE.—August 1st, 1913. SEX.—?
PLACE.—Poole (Station). DURATION.—5 minutes.

FOOD.—A similar observation to July 24th.

OBSERVER.—W. P. Curtis TIME.—5.30 p.m.
DATE.—August 1st, 1913. SEX.—?
PLACE.—Bournemouth. DURATION.—Five minutes.

FOOD.—A similar observation to July 31st. On this occasion a young bird, after catching several ants, got hold of a honey bee (*Apis mellifica*) worker by mistake. It dropped the bee like a hot brick. The bee went off with an angry swinging flight, apparently none the worse, but the sparrow, after shaking its head very vigorously for a bit rubbed its bill very hard against the edge of the kerb. It had evidently been stung.

Observer.—E. H. Curtis. Time.—?
Date.—June 22nd, 1914. Sex.—♀.
Place.—Poole. Duration.—Casual.

Food.—*Eupithecia* (sp. ?), attack not completed; bird alarmed by E.H.C.

Observer.—W. P. Curtis. Time.—9.45 a.m.
Date.—July 10th, 1914. Sex.—♀.
Place.—Littledown Rd., Bournemouth. Duration.—Casual.

Food.—Came out of a fir tree with a grey *Noctua* held across the thorax with wings spread each side of the bill. Prey looked like *Acronycta psi* or *A. tridens* (the former is fond of sitting on fir trees here). Before I could make sure a ♂ *P. domesticus* tried to rob the captor, who fled incontinently with ♂ in pursuit under forced draught. I am morally certain the insect was taken at rest.

Observer.—W. P. Curtis. Time.—1.45 p.m., *circa*.
Date.—September 23rd, 1914. Sex.—?
Place.—Pleasure Gardens, Bournemouth. Duration.—Casual.

Food.—Bird came out of a bush with *Orthosia macilenta*, rubbed the insect on the ground to get the fluff off, caught sight of W.P.C. and bolted back.

Observer.—E. H. Curtis. Time.—?
Date.—March 21st, 1914. Sex.—?
Place.—Canford, Dorset. Duration.—Casual.

Food.—A Dipterous fly, hawked after the manner of *Muscicapa griseola*.

Observer.—W. P. Curtis. Time.—?
Date.—May 26th, 1914. Sex.—?
Place.—Poole. Duration.—Casual.
Food.—*Pieris brassicae*.

Observer.—J. T. Curtis. Time.—?
Date.—June 1st, 1914. Sex.—?
Place.—Poole. Duration.—Casual.

Food.—*Melanippe fluctuata* disturbed by garden hose; two sparrows hustled each other and the insect escaped.

[Note.—Number of attacks on insects recorded 13. Out of the 13, eight were on Lepidoptera, 6 of these were successful. Out of the same 8 two were certainly and a third almost certainly (a 99% certainty) at rest.]

5. **Fringilla coelebs, L.** The Chaffinch.

Observer.—E. H. Curtis. Time.—1.10 to 4 and 4.10 to 4.35.
Date.—May 16th, 1915. Sex.—22 ♂, 4 ♀
Place.—Canford, Dorset. Duration.—3 hours and 25 minutes.

[Note.—26 visits to the nest.]

Observer.—E. H. Curtis. Time.—11.10 to 12.50.
Date.—May 23rd, 1915. Sex.—9 ♀, 3 ♂.

Place.—Canford, Dorset. Duration.—1 hour 40 minutes.
[Note.—12 visits to the nest.]

Observer.—E. H. Curtis. Time.—1.45 to 4.5.
Date.—May 23rd, 1915. Sex.—7 ♀, 9 ♂.
Place.—Canford, Dorset. Duration.—2 hours 10 minutes.
[Note.—16 visits to the nest.]

Food.—The food on every occasion was entirely green or pale yellowish-green Lepidopterous larvæ, mostly *Geometrae*.

Observer.—W. P. Curtis. Time.—9.40 a.m.
Date.—July 15th, 1916. Sex.—♀.
Place.—Broadstone, Dorset. Duration.—Casual.

Food.—Hunted a *Camptogramma bilineata* out of a hedge into the open, and into the hedge again, could not see if attack completed.

[Note.—There are here 55 observations, only one of which is an attack on a lepidopterous imago, and it is not known whether that one was completed, but the one attack was on an insect at rest.]

6. **Emberiza citrinella, L.** The Yellow Bunting.

Observer.—W. P. Curtis. Time.—Morning.
Date.—June 1st, 1914. Sex.—♂ and ♀.
Place.—Widdam Down, Owslebury. Duration.—40 minutes.

Food.—Observations at nest. Both parents fed with beetles and insects; but I had lost my pencil and could keep no proper note, moreover, the birds poked through the bushes at the back of the nest.

Time.—Afternoon, 2.10. Duration.—1¼ hours.
Food.—Unidentified. Sex.—♂.

Time.—2.15. Sex.—♀.
Food.—Unidentified.

Time.—2.25. Sex.—♀.
Food.—Unidentified.
Time.—2.26. Sex.—♂.
Food.—Unidentified.

Time.—2.28. Sex.—♀.

Food.—A Hymenopterous fly. I afterwards found a fly on a clump of spruce near, from which the parents were getting food which had the coloration of this fly, but it was a Dipteron, so I may have been mistaken.

Time.—2.32. Sex.—♂.
Food.—Unidentified.

Time.—2.33. Sex.—♂.
Food.—Small black flies.

Time.—2.34. Sex.—♀.
Food.—Small beetles with red undersides to the abdomen.

Time.—3.5. Sex.—♀.
Food.—Small insects.

Time.—3.7. Sex.—♀.
Food.—No food.

TIME.—3.12. SEX.—♂.
FOOD.—Very tiny insects.

TIME.—3.22. SEX.—♂.
FOOD.—Unidentified.

[Note.—This was a day of brilliant sunshine with a strong breeze; insects were very lively and active. Twelve visits are recorded. I was unable to identify the food six times, no food was brought once. On the five occasions the food was identified it was insect food, but not once could I say it was Lepidoptera.]

OBSERVER.—W. P. Curtis. Same pair of birds.
DATE.—June 2nd, 1914. DURATION.—2¼ hours.
PLACE.—Widdam Down, Owslebury. SEX.—♂ and ♀.
TIME.—10.30.
FOOD.—A quantity of insects. Whilst he was feeding the young one of the insects escaped from his bill and bolted into the grass near the nest. It was a small *Tortrix*, and looked like *Epiblema pflugiana;* the bird followed it, and after a hunt captured it, and stuffed it wings and all down a young bird's throat.

TIME.—10.40. SEX.—♂
FOOD.—Unidentified.

TIME.—10.47. SEX.—♂.
FOOD.—Unidentified. Up to this time the ♀ had merely been sitting on a bush uttering a mournful squeak, she now joined the ♂ in feeding the family.

TIME.—10.48. SEX.—♀.
FOOD.—Unidentified.

TIME.—10.56. SEX.—♀.
FOOD.—No food.

TIME.—10.57. SEX.—♂.
FOOD.—Unidentified.

TIME.—11.3. SEX.—♀.
FOOD.—Very small insects.

TIME.—11.6. SEX.—♀.
FOOD.—Tiny black insects.

TIME.—11.13. SEX.—♀.
FOOD.—Small insects.

TIME.—11.18. SEX.—♀.
FOOD.—Small insects.

TIME.—11.33. SEX.—♀.
FOOD.—Three Crambites. *Crambus dumetellus* was common in the neighbourhood, and I had a good opportunity of seeing the insects. I do not think they were *Crambus pratellus.* I went out on the down immediately to ascertain for certain what insects there were about. During this period the ♂ was singing.

TIME.—12.15. SEX.—♂.
FOOD.—Four Crambites.

TIME.—12.15. SEX.—♀.

FOOD.—Unidentified. (I had to go out here to drive away sheep, and this disturbed the birds.)

TIME.—12.29. SEX.—♂.
FOOD.—Unidentified.

TIME.—12.30. SEX.—♀.
FOOD.—Unidentified.

TIME.—12.30. SEX.—♂.
FOOD.—Unidentified.

TIME.—12.35. SEX.—♂ and ♀.
FOOD.—Unidentified.

TIME.—12.40. SEX.—♂.
FOOD.—Unidentified.

TIME.—12.42. SEX.—♂.
FOOD.—Unidentified.

TIME.—12.45. SEX.—♀.
FOOD.—*Epiblema* (sp. ?) and 3 *Crambus dumetellus.* (?)

TIME.—12.45. SEX.—♂.
FOOD.—*Coenonympha pamphilus.*

[Note:—I had to leave at this point and the next day when I hoped to continue I found the young had quitted. This day was dull and thundery and very few insects were moving. I saw no Lepidoptera moving except those I kicked up. 21 visits are recorded. On twenty occasions food was brought; I failed to identify it eleven times. The other nine times it was always insects and five times out of the nine it was Lepidoptera or partly Lepidoptera, which were I feel certain taken at rest. I particularly draw attention to the number brought, *viz.*, thirteen in five visits. Also to the time taken. The ♀ took a quarter of an hour to get three Crambites. The ♂ was about ten minutes getting four. The ♀ ten minutes getting one *Epiblema* and three *Crambites* whilst the ♂ was exactly three minutes getting the *C. pamphilus.*]

[Note:—With regard to times my brother and I have had occasions to work at one nest with two hiding tents, each independently noting his own times, and we were unable to check as I cannot hear him speak (unless he shouts very loudly) through the two thicknesses of tent material, we have been surprised after to find that we rarely vary a second on times if we synchronize our watches at the start as we usually do, so I think it may be assumed that the times recorded above are correct to within a second or two.]

OBSERVER.—E. H. Curtis. TIME.—?
DATE.—August 16th, 1914. SEX.—♀.
PLACE.—Swanage, Dorset. DURATION.—Casual.
FOOD.—Grasshopper.

[Note:—Total 34 records. Food brought 82 times. Food identified sixteen times. Insect food every time. Lepidoptera brought five imes.]

(*To be continued.*)

Records of some New British Plant-galls. V. More New Cecidomyid Galls.

By RICHARD S. BAGNALL, F.L.S., F.E.S., and J. W. H. HARRISON, M.Sc.

(Continued from vol. xxviii., p. 252.)

The following notes chiefly include some late autumn records, and practically complete our notes on Gall-midges for the season. So many interesting species have rewarded our spare time collecting this past season that we propose publishing a preliminary list of the British *Cecidomyidae*, with special reference to the Gall-midges, as a basis for future work.

Our next contribution in this series will deal with Mite or Eriophyid-galls not previously recorded from the British Isles.

Lasioptera carophila, F. Loew.

Abroad this species is known to gall many species of Umbel though not recorded on *Anthriscus*.

Durham, on *Anthriscus silvestris*, Wolviston, J.W.H.H.

Lasioptera sp. (Houard, no. 251).

Swelling in stem (well above ground) of *Molinia coerulea*, containing a large orange larva.

Durham, near Lanchester, J.W.H.H.

Rhopalomyia valerii, Tavares.

On juniper; chiefly known from the Mediterranean on *Juniperus oxycedrus*, but recently (1912) recorded by Cotte from France, on the Common Juniper.

Lancashire and Westmorland, Hampsfell and Meathop Fell, Grange-over-Sands, R.S.B.

Oligotrophus panteli, Kieffer.

On juniper. Known throughout Europe.

Lancashire and Westmorland, Grange-over-Sands district, R.S.B.

Oligotrophus sp. (Houard, no. 125).

On juniper.

Lancashire, Hampsfell, Grange-over-Sands, rare, R.S.B.

Phegobia tornatella, Bremi. (=Houard, no. 1,154).

Glabrous gall on upper surface of Beech leaves.

Northumberland, Langley Woods, R.S.B.
Durham, Gibside and Fencehouses, R.S.B.
Cumberland, Alston, R.S.B.

Mayetiola dactylidis, Kieffer.

On Cock's-foot grass, *Dactylis glomerata*.

Durham, near Penshaw, R.S.B.

Mayetiola joannisi, Kieffer.

On *Poa nemoralis*.

Durham, between Wolviston and Billingham, Gibside, J.W.H.H.
Lancashire, Grange-over-Sands, R.S.B.

[*Chortomyia hellwigi*, Rübs.]

On *Brachypodium silvaticum*. This is the Cecidomyid sp., no. 62, of Swanton, and Houard, no. 297.

DURHAM, Penshaw; locally common, R.S.B.

LANCASHIRE, Grange-over-Sands, R.S.B.

Macrolabis hieracii, Kieffer.

LANCASHIRE, Birkdale, on *Hieracium* sp., R.S.B.

(Connold records *M. corrugans* from *Hieracium boreale*, but it is almost certainly to be referable to this species).

Macrolabis hippocrepidis, Kieffer.

On *Hippocrepis comosa*.

WESTMORLAND, Meathop Fell, near Grange-over-Sands, in October; gall only, R.S.B.

Perrisia axillaris, Kieffer.

On *Trifolium* sp.

LANCASHIRE and WESTMORLAND, once near Grange-over-Sands.

Perrisia beckiana, Mik.

On *Inula squarrosa* (=*I. conyza*), Houard, 5,623.

LANCASHIRE, Grange-over-Sands; apparently plentiful, R.S.B. J.W.H.H. has observed similar galls on *Pulicaria dysenterica*.

Perrisia brunellae, Kieffer.

On *Prunella vulgaris*.

YORKSHIRE, Stainton, J.W.H.H.

NORTHUMBERLAND, Ovington, R.S.B.

Perrisia (*Dasyneura*) *corylina*, Kieffer (*coryli*, Rübs.).

LANCASHIRE, Grange-over-Sands, R.S.B.

YORKSHIRE, Guisborough, J.W.H.H.

Perrisia daphnes, Kieffer.

On *Daphne laureola*.

YORKSHIRE, Gunnergate, R.S.B.

Perrisia (*Dasyneura*) *kiefferi*, Marchal.

In flowers of ivy.

LANCASHIRE and WESTMORLAND, Grange-over-Sands; common, R.S.B.

DURHAM, Gibside, R.S.B.

YORKSHIRE, Middlesbrough and Gunnersgate, J.W.H.H.

Perrisia libera, Kieffer.

On Oak, somewhat analogous to *Oligotrophus coryli* on Hazel.

DURHAM, Fatfield, R.S.B.

Perrisia malpighii, Kieffer.

On Oak; parenchymous.

DURHAM, Gibside, R.S.B.

LANCASHIRE, Grange-over-Sands, R.S.B.

Perrisia sp.

In heads of *Centaurea scabiosa*; larvæ orange-red, small. *Not* the species recorded from heads of *C. nigra* (*Ent. Rec.*, 1916, p. 199), though that species and *P. mikii* have both been taken by us on *C. scabiosa*.

DURHAM, Claxheugh Rock, near Sunderland, R.S.B.

Perrisia sp.

In heads of a garden *Helianthus*, gregarious larvæ, golden yellow-orange to orange-red.

DURHAM, Fatfield, R.S.B.

? *Perrisia rübsaameni*, Kieffer.

In leaves of Hornbeam, parenchymous. The following records simply refer to clear-cut circular holes, which suggest the presence of this species, but require confirmation.

LANCASHIRE, Grange-over-Sands, R.S.B.
DURHAM, South-East, J.W.H.H.

Perrisia sp.

On Lime, like *P. thomasiana*, but larvæ, throughout growth, milk-white.

DURHAM, near Chester-le-Street.

Perrisia sp.

In flowers, which remain closed, of *Myosotis arvensis*. Kieffer has described two species from the flower of *M. palustris*.

LANCASHIRE, Grange-over-Sands, R.S.B.

Anabremia viciae, Kieffer (nom. nov. for *Clinodiplosis longiventris*, larva but not imago), already recorded by us.

Hadrobremia longiventris, Kieffer (imago not larva) = *Clinodiplosis trifolii*, already recorded by us.

Stictodiplosis (*Contarinia*) *umbellatarum*, Rübs.

Galling flowers of *Pimpinella magna*.

LANCASHIRE, near Grange-over-Sands, R.S.B.

Haplodiplosis (*Clinodiplosis*) *equestris*, B. Wagner.

LANCASHIRE, Grange-over-Sands, on a common grass, *Triticum*, sp., or near ally, R.S.B.

Harmandia pustulans (=Houard, 513).

On Aspen.

YORKSHIRE, Nunthorpe, J.W.H.H.

Clinodiplosis schlechtendali, Rübs.

At apex of seed-pod, *Convolvulus sepium*.

DURHAM, between Wolviston and Greatham, J.W.H.H.

Mycodiplosis, sp.

Crimson larvæ feeding on *Puccinea* sp. on *Cirsium arvensis*.

DURHAM, Fatfield, R.S.B.

Amblyspatha ormerodi, Kieffer.

Described from Scotland in 1913, See *Marellia*, vol. 12, p. 52.

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Cecidomyia sp. (Houard, 5,129).

On *Rhinanthus christi-galli.* This and the three following are recorded in Houard from the British Isles, but are not included in Swanton's catalogue.

Cecidomyia sp. (Houard, 2,456).

On *Thalictrum dunense.*

Cecidomyia sp. (Houard, 3,237).

On *Rosa spinossissima.*

Cecidomyia sp. (Houard (supplement), 1,911).

On *Brassica rapa.*

* * * * *

Cecidomyia sp.

On *Quercus robur* and *Q. cerris.* Acorn dwarfed and deformed; larvæ gregarious; salmon-coloured, living in cup at base of acorn. Probably common.

Durham, Gibside, R.S.B.
Lancashire, Grange-over-Sands, R.S.B.
Yorkshire, Middlesbrough, J.W.H.H.

SCIENTIFIC NOTES AND OBSERVATIONS.

Resting Attitude of the Lycaenidae.—With regard to Mr. Hamm's experience of the resting attitude of *Polyommatus icarus* before retiring to rest (*antea*, p. 139), I can only say that my experience with this species is very similar, as I instanced in my previous note.

I also agree that *Rumicia phlaeas* is nothing like so constant as *P. icarus* in resting head downward, which to my mind is further evidence that my theory of the head-downward position of *P. icarus* has a relation to the sunning position, because *R. phlaeas* suns both head downward and head upward. *P. icarus* I should say very seldom suns head upward, at least I do not remember to have observed it.

A point that strikes me is that if it is necessary for *P. icarus* to rest head downward as a protection from birds, surely it would be equally necessary for *R. phlaeas* to do so also. I have seen *P. icarus* take up a position head downward, on a sunless afternoon, and repeatedly open their wings for a moment, as though expecting the sun to appear.

Mr. Hamm goes on to say that his experience does not support my interpretation of the head downward position, but unfortunately he does not give any concrete evidence of birds being deceived by the orange spots of *P. icarus*, and if there is anything in his suggestion of the black spots near the apex of the underside of the forewing of *R. phlaeas* being a directive mark to a possible enemy, I should be very sorry for the butterfly if a bird were hunting these insects at the time.

I am afraid Mr. Hamm, like a good many other people, underrates the intelligence of birds, and I should have liked him to have been present when I watched the pair of Stonechats taking *Agriades coridon* at rest on long grass (*Ent. Record*, July-August, 1911). They did not bother about the orange spots on the hindwings or the most vulnerable point, but simply cleared off the butterflies, ♂ and ♀, as fast as they could. The House Sparrows at Herne Bay (*Ent. Record*, July-August, 1911), taking *Epinephele jurtina*, did not bother about eye spots or variations of the undersides, but snapped up the butterflies as fast as they could. I do not attach the importance that Mr. Hamm does to the "injuries such as enemies would inflict, which have been frequently observed near the anal angle of the hindwing," and would refer him to my remarks on the subject in the *Ent. Record*, vol. xxvi., p. 165.

On the 2nd of July, this year, I went for an evening walk over one of the New Forest heaths, and came across a scattered colony of *Plebeius aegon* at rest. The sun had just set, and the majority of the butterflies were resting on the heather head downward, some, however, were resting with their wings parallel with the earth, and seven were resting head upward, these latter were more or less worn.

Unfortunately, on account of the war, I had no camera with me, and I also had no opportunity of making observations after dark, having no lamp for the same reason.

In pill-boxing some specimens I noticed that in a number of cases they were more wide awake than *P. icarus*. On the approach of the pillbox they jerked themselves off the twig on which they were resting and if they landed in the pill box lay on their sides, and remained motionless. If, however, they landed in the heather they immediately wound their way through the twigs to the ground, where they remained motionless on their sides on the brown earth, and were quite easy to see. On the following evening I again visited the ground with a friend who is a believer in Protective Resemblance, but he had to admit that *P. aegon* were quite easy to see on the dark heather.—C. W. COLTHRUP, 103, Woodwarde Road, E. Dulwich, S.E. *November 4th*, 1916.

THE "CARRYING" HABITS OF THE SEXES IN PAIRED BUTTERFLIES.—I have taken an interest in this subject for some years, and made observations, some of which I have recorded in the *Ent. Record*.

When a ♀ of a species carries the ♂ all my subsequent observations have confirmed the assumption that it is a fixed rule with that species. Further, from observations on *Epinephele jurtina*, *E. tithonus* and *Coenonympha pamphilus*, in all of which the ♀ carries the ♂, I had almost come to the conclusion that where one species was observed in which the ♀ carried the ♂ or *vice versa*, it would be found that all the nearly allied members of the family would follow the same rule. In the case of the "blues," repeated observations have shown that in both *Agriades coridon* and *Polyommatus icarus* the ♂ carries the ♀. On reading the Rev. G. Wheeler's note on the above subject (*antea*, p. 204) I referred to my notes and found that his observations on *E. jurtina* agreed with mine. Unfortunately I have no records of my own of either *Argynnis aglaia* or *A. cydippe* (*adippe*) flying *in cop*, but the fact that in both these species the ♀ carried the ♂ seemed to bear out my suggestion in reference to nearly related species. On referring to the *Ent. Record*, vol. xiii., p. 298, I was surprised to find that the late J. W. Tutt stated that "whilst on the Mendelstrasse, in August, 1895, I repeatedly observed the ♂ of *Dryas paphia* carrying the ♀ when paired, never the opposite." Again he says, "During my visit to the Vaudois, July 25th-August 24th, this year, I again many times saw *Dryas paphia* flying whilst *in copulâ*. The male invariably, in my experience, carried the female, and I must have made the observation during the last month at least a score of times, a half of these, perhaps, being a typical ♂ *paphia* paired with a ♀ var. *valesina*. It is remarkablè that, however worn and battered, and apparently incapable the ♂ may be physically to accomplish a flight, the ♀ never attempts, in my experience, to fly, either hanging motionless or slightly separating its wings, as if to make itself ride more lightly. The ♂ *Argynnis niobe* also carries the ♀, and I have seen a ♂ of this species, so worn and broken as to be incapable of flying more than a yard or two at a time, paired with a large, heavy, newly emerged ♀, make strenuous efforts to escape capture, rising and settling positively fixed. In some of the 'blues' the ♂ again carries the ♀, but I believe I have somewhere recorded that, among some of the Melitaeas, *e.g.*, *M. didyma*, the ♀ always carries the ♂. On the other hand ♂ *Melanargia galathea* always carries the ♀, even when the former is worn to rags."

Tutt's observation on the "blues" agrees with mine; the Melitaeas I have not been lucky enough to observe *in copula*, but his observation is what I should expect, and also that on *M. galathea*, as I have often observed ♂ *Pieris rapae* carrying the ♀.

Tutt's note, however, was in reply to a note on the same page by Mr. F. B. Newnham, who recorded having found a ♂ *A. adippe in cop.* with a ♀ *D. paphia*, and who expressed surprise that the ♂ *A. adippe* carried the ♀ *D. paphia*, and says, "This is quite contrary to my experience, having invariably observed the ♀ carrying the ♂ when flying. Later in the afternoon I disturbed two *D. paphia in cop.* and when on the wing the ♀ did all the flying."

I am aware that it is dangerous to use the words "always" and "never," when dealing with natural phenomena, but I have found the carrying habits of butterflies when paired so constant, that I am wondering if the habits of *D. paphia*, and possibly *A. adippe* and *A. aglaia* (as suggested by ♂ *A. niobe* carrying ♀) are different on the Continent. It would be interesting if readers who have notes from actual observation of butterflies flying when paired, would record them in the *Ent. Record*.—C. W. Colthrup, 103, Woodwarde Road, East Dulwich, S.E. [I have recorded in the case of *aglaia* and *niobe* that the ♀s carried the ♂s in the Engadine, *antea* p. 89.—H.J.T.]

Further note on Agriades coridon, hispana and aragonensis.—I ought perhaps to have added to my notes on *Agriades coridon* and var. *arragonensis*,* that I met with *hispana* only in the Albarracin area, Albarracin, Bronchales, Tragacete, whilst *arragonensis* occurred also at Avila and Navalperal in the Guadarramas, and at Soria, a good way to the north, almost in the Moncayo area. I think I met with it at other points, but the above are all that specimens still in my possession enable me to be sure of. They are sufficient, however, to justify the statement that, so far as my observation goes, *arragonensis* has a rather wide distribution, *hispana* a comparatively very narrow one. I have one specimen of *coridon* from Puerto de Pajares, in the Cantabrian Mountains, this has a very ordinary European aspect.—T. A. CHAPMAN, M.D., Betula, Reigate.

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* *Ent. Rec.*, vol. xxviii., p. 237.

CURRENT NOTES AND SHORT NOTICES.

In the *Can. Ent.* for October, L. W. Swett contributes an article on the Genus *Xanthorhoë* (*Petrophora*) as represented in America. The species dealt with is *Ochyria defensaria*, a species somewhat resembling our British *X. munitata* in one of its forms, but very variable. It is a common species in Victoria and California.

In the *Ent. Mo. Mag.* for October the following new species of the genus *Ernobius* (Coleoptera) are announced by Mr. D. Sharp. *E. mulsantianus* from the New Forest on burnt fir-trees, and *E. reversus* from Brockenhurst. The Rev. F. D. Morice adds the Bee *Nomada conjugens* (*dallatorreana*) to the British List from Swanage. Mr. R. S. Bagnall announces finding galls of a new British Psyllid, *Trioza proxima* at Penshaw and Roker, although the imago has not yet been obtained. Mr. H. S. Wallace announces a gall of a new British Cecidomyid on meadow grass, *viz.*, *Mayetiola radicifica*, and later he took imagines at Nenthead, etc.

In the *Entomological News* for October occurs the following curious observation made near Los Angeles, California. "Great numbers of *Melitaea chalcedon* were flitting up and down the road and settling on certain moist, sandy spots. Suddenly a grey ground squirrel ran out on one of these spots and apparently caught a butterfly, then set up on its hind legs and worked over it. I tried several times to get closer, but succeeded only in scaring away the squirrel. Each time, however, it returned and went through the same performance. Finally I walked up and examined the spot, where to my astonishment I found quantities of *M. chalcedon* wings. I counted roughly up to a hundred wings. —J. R. Haskin."

The quarterly numbers 2 and 3 of the *Jour. of Ent. and Zool.*, Claremont, California, contain the usual number of well illustrated articles. Prof. T. D. A. Cockerell has an article on New and Little-known Bees from California. Fordyce Grinnell describes and names a sub-species of the butterfly, *Rusticus acmon*, a Lycænid, as sub-sp. *cottlei*, from near San Francisco. There are half a dozen very good photographic figures. E. O. Essig writes on the genus *Vanessa* in California, discussing the species *V. atalanta*, *V. carye*, and sub-sp. *muelleri*, *V. huntera*, and *V. cardui*. He gives a long list of food plants and three plates, with numerous figures of imagines and other stages.

The Officers and Council of the Entomological Society of London for the ensuing year are as follow:—*President*, C. J. Gahan, M.A., D.Sc. *Treasurer*, A. H. Jones. *Secretaries*, Commander J. J. Walker, M.A., R.N., F.L.S., and the Rev. Geo. Wheeler, M.A., F.Z.S. *Librarian*, G. C. Champion, A.L.S., F.Z.S. *Council*, A. W. Bacot, T. A. Chapman, M.D., F.Z.S., E. A. Cockayne, M.A., M.D., W. C. Crawley, B.A., H. Willoughby Ellis, J. C. F. Fryer, M.A., A. E. Gibbs, F.L.S., F.Z.S., G. B. Longstaff, M.A., M.D., S. A. Neave, M.A., B.Sc., F.Z.S., R. M. Prideaux, the Hon. N. C. Rothschild, M.A., F.L.S., F.Z.S., and A. E. Tonge.

The Officers and Council of the South London Entomological

Society for the ensuing year are as follow:—*President*, H. J. Turner, F.E.S. *Vice-presidents*, R. Adkin, F.E.S., and A. E. Gibbs, F.L.S., F.E.S., F.Z.S. *Treasurer*, T. A. Hall, F.E.S. *Librarian*, A. W. Dods. *Curator*, W. West (Greenwich). *Editor of Proceedings*, H. J. Turner, F.E.S. *Hon. Secretary*, Stanley Edwards, F.L.S., F.Z.S., F.E.S. *Council*, S. R. Ashby, F.E.S., W. J. Ashdown, K. G. Blair, B.Sc., F.E.S., G. Brooks, F. W. Frohawk, F.E.S., M.B.O.U., D. R. Morford, C. W. Sperring, A. E. Tonge, F.E.S., W. West, L.D.S. (Ashtead).

In the *Bull. Soc. Ent. France* for October M. Mabille and M. Boullet describe a considerable number of new species and new forms of known species of *Hesperiidae* from various parts of the world.

In the *Naturalist* for November is an interesting account of a fight between an earwig and some ants (*Myrmica ruginodis*) by H. V. Corbett, which lasted some two hours and finally resulted in the former being overpowered and dragged into the nest. The forceps were used for the defence but were "clumsy weapons, and useless, except when the actual points closed on the ants," who often dodged them very cleverly.

The *Ann. Report of the Entomological Society of Ontario* for 1915, was late in coming to hand. It is a somewhat larger issue than in previous years. It contains the usual reports from the officials of the Society, from the conductors of the experimental sections, and from the local branches of the Society. This year there seems to be a much longer series of special studies of insects that have been economically to the fore from their injurious attacks. Among them are Locust Control Work in E. Canada, work carried on against the Gipsy and Brown-tail Moths in Canada and the U. States, Control of the Cabbage-maggot, Life-history of Chermes sp., Various Notes on Bot-flies, the Army-worm in Alberta, Aphid and Capsid attacks on Apple-trees, Leaf-roller (Tortrices) attacks on various trees, and various Injurious Weevils and their Controls. There are numerous illustrations and in addition a Preliminary List of Parasitic Insects and their hosts which are known to occur in Canada.

We read that our old friend (enemy) *Coleophora laricella* the larch pest has appeared in New Jersey, evidently introduced from Europe in nursery stock. (*Ent. News.*)

In the *Ent. Mo. Mag.* for November Dr. G. W. Nicholson announces the capture of a Coleopteron, *Lycoperdina succincta*, new to Britain, near Barton Mills, Suffolk. Fifteen specimens were taken in October last from ripe *Lycoperdon gemmatum*. It is differentiated from its near ally *L. bovistae* by its colour, being less shiny and considerably narrower and less contracted in the middle. The antennae are stouter and shorter. Prof. Hudson Beare establishes the Coleopteron *Sphaeriestes gabrieli* as a British species, and differentiates it from *S. foveolatus* with which species it has been confused hitherto. Mr. Kenneth J. Morton gives an account of Chartley Moss, Staffordshire, and the Neuroptera found there. He did not meet with the rare species *Leucorrhinia dubia* which occurs there.

The Waterhouse collection of Coleoptera has, we understand, been acquired for the Museum of the Entomological Department of the University of Edinburgh.

In the *Ent. News* for November Prof. J. McDunnough has an important nomenclatorial article "On the Types of Certain Noctuid Genera occurring in North America," in which he points out that Sir

George Hampson in the "Cat. Lep. Phalænæ of the Brit. Mus." has "in every instance, irrespective of the work of any previous entomologist, fixed the type of each genus, when not particularly specified by the author, as the first species placed under the generic name," resulting in many instances in most confusing interchange of generic names. All the principal genera are dealt with in detail. It must be noted that McDunnough disregards the *Tentamen* of Hübner. The old conception of most of the genera has been conserved by these researches.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

October 4th, 1916.—ELECTION.—Mr. Howard M. Peebles, 13 Chesham Street, S.W., was elected a Fellow of the Society.

VOTE OF CONDOLENCE.—A vote of condolence with Mrs. Trimen, on the death of her husband, a former President of the Society, was passed unanimously.

EXHIBITIONS.—METHOD OF DESTROYING LOCUSTS.—Mr. P. A. Buxton called the attention of the Society to some remarkable work published in the "Ann. Inst. Pasteur" (Paris) for July and August 1916. A plague of the locust (*Schistocerca peregrina*) has been successfully stayed in Morocco by infecting a few thousands with the cocco-bacillus of a fatal enteritis.

A NEW BRITISH ANT.—Mr. Donisthorpe exhibited ♂ ♂, ♀ ♀ and ☿ ☿ of *Myrmica schencki*, Emery, discovered at Sully, Glamorganshire, by Mr. Hallet last year, and identified and introduced as British by himself.

LEADEN-COLOURED ABERRATIONS OF AGRIADES THETIS.—Mr. L. W. Newman exhibited two leaden-coloured ♂ ♂ of *Agriades thetis* and a curious ♂ having part of the wings leaden colour and part the normal blue; all taken on the wing in September 1916 in East Kent.

TERATOLOGICAL COLEOPTERA.—Mr. O. E. Janson exhibited a male specimen of *Carabus catenulatus*, showing arrested development in the left posterior leg. An example of *Tetropium gabrieli* in which the right antenna consisted of only eight joints and bore a basal branch of three joints. A specimen of *Dorcadion egregium* from Mongolia, exhibiting a very rare instance of an almost symmetrical duplication of a limb, both of the antennæ bearing a short three-jointed branch arising from the large basal joint, the antennæ themselves being otherwise normal.

ABERRATIONS OF ARCTIA CAJA.—Mr. Janson also exhibited on behalf of Mr. F. W. Frohawk two remarkable varieties of *Arctia caja* reared this season from larvæ from the Scilly Islands.

PAPERS.—"Gynandromorphous Lepidoptera," by E. A. Cockayne, M.A., M.D., F.E.S.

"The Rein-sheath in Plebeiid Blues. A correction of and addition to Paper VI," by T. A. Chapman, M.D., F.Z.S.

"Resting Attitudes in Lepidoptera. An example of Recapitulation in Habit," by the same.

"The Evolution of the Habits of the Larva of *Lycaena arion*," by the same.

"*Micropteryx* entitled to Ordinal Rank. Order Zeugloptera," by the same.

October 18th, 1916.—ELECTION OF FELLOWS.—Prof. E. Bugnion, La Luciole, Aix-en-Provence, France, and Rev. Bruce Cornford, 13 Havelock Road, Portsmouth, were elected Fellows of the Society.

SOME NEW AND LITTLE-KNOWN EXAMPLES OF RESEMBLANCE IN BUTTERFLIES.—Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited several new Chinese and S. American examples.

EXPERIMENTS ON SPIDERS WITH BUTTERFLY FOOD AND OBSERVATIONS ON THE ATTACKS OF BIRDS ON BUTTERFLIES, IN BRITISH EAST AFRICA, BY THE REV. K. ST. AUBYN ROGERS.—Prof. Poulton gave an account of some experiments and observations conducted in 1908, 1910, and 1911 at Rabai, about 120 miles N.W. of Mombasa.

SPECIALISATION IN THE RESPONSE OF BUTTERFLIES TO STIMULI.—Prof. Poulton drew attention to an observation on *Lycaena thetis* (*bellargus*,) Rott. He found that when a butterfly was carefully approached so that it was evidently unaware of the presence of the observer, it could be gently tapped or stroked with the feathery end of a long grass stem without causing it any alarm. It was evident that such stimuli, which would, of course, continually be caused by the wind under natural conditions, were sharply distinguished from those normally caused by possible enemies.

A GYNANDROMORPHOUS ANT.—Mr. Donisthorpe exhibited an ergatandromorph of *Myrmica laevinodis* which he had taken in his garden at Putney on October 11th.

MERMITHOGYNES OF LASIUS FLAVUS AND L. ALIENUS.—Mr. W. C. Crawley exhibited mermithogynes of *Lasius flavus* and *L. alienus* taken at Porlock.

WINGED FEMALES OF FORDA FORMICARIA AND F. VIRIDANA.—Mr. Crawley also exhibited the alate ♀ ♀, hitherto unknown, of the common ant aphids, *Forda formicaria*, Heyden, and *F. viridana*, Buckton, taken at Porlock with *Lasius alieno-niger*.

JAPANESE FEMALE PSYCHID AND CASE.—Dr. Cockayne exhibited a ♀ Psychid bred July 1916 from a larva found on a Japanese dwarf cedar at Hammersmith, together with the larval case.

MELANIC AND OTHER ABERRATIONS OF BRITISH GEOMETERS.—Mr. L. W. Newman exhibited true melanic (unicolorous black) specimens of *Eupithecia lariciata* from Warwickshire; melanic specimens of *Boarmia consonaria* from Kent; dark type, intermediate and melanic specimens of *B. consortaria* from Warwickshire; also on behalf of Mr. G. B. Oliver two curious aberrations of the latter species.

PUPAL CELL OF DYTISCUS MARGINALIS.—Mr. H. Main exhibited a pupal cell *in sitú* of the beetle *Dytiscus marginalis*, together with a spectroscopic photograph of the pupa in its cell, showing how it rested on it its extremities, the rest of the body being unsupported.

RARE BRITISH COLEOPTERA.—Mr. Bedwell exhibited on behalf of Mr. C. J. C. Pool an exceptionally large ♂ of *Emus hirtus* taken near Rochester in September, and also a specimen of *Megapenthes lugens* taken by Mr. D. Cumming, in May 1915, on holly blossom near Lyndhurst.

Mr. Bedwell also exhibited a living specimen of *Elater coccinatus* from Waltham Abbey, with examples of *E. pomonae* and *E. sanguinolentus*, and the thorax of each species mounted separately for comparison.

PAPERS.—The following papers were read:—

"Falkland Island Diptera," by C. G. Lamb, M.A., B.Sc.; communicated by F. W. Edwards, F.E.S.

"Observations on the Growth and Habits of the Stick Insect, *Carausius morosus*, Br.," by H. Ling Roth; communicated by Prof. Poulton, D.Sc., F.R.S., etc.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

Sept. 14*th*.—SPECIAL EXHIBITION AND DISCUSSION.—The meeting was spent in a consideration of *Pararge aegeria*. The President introduced the subject with a series of notes on the following points: I. Original Description. II. Enlarged and modified subsequent descriptions. III. History of the Nomenclature. IV. Times of appearance. V. Evidences of Growing Scarcity in this country. VI. Experiments in breeding. VII. Variation. 1. General characteristics. 2. Lines of variation. 3. Sexual variation. 4. List of aberrations (striking aberrations are very rare). 5. Geographical races. VIII. Suggested questions for further investigation.

Mr. Gibbs discussed some of the same points especially referring to his own observations of the growing scarcity of the species.

Mr. Platt-Barrett gave his experiences of the species for the past 50 years.

Dr. Chapman, Messrs. Gibbs, Curwen, Platt-Barrett, Leeds, and Turner exhibited the various forms from the British Isles and many parts of the continent. A number of members took part in the discussion.

September 28*th*, 1916.—SQUIRTING HABIT OF C. LIGNIPERDA.—Mr. T. W. Hall exhibited a larva of *Cossus ligniperda* and called attention to the habit, when annoyed, of emitting an evil smelling liquid.

ABERRATIONS OF A. THETIS.—Mr. Newman, a dark leaden aberration of *Agriades thetis*, one of several taken recently in Kent.

GRASSHOPPERS ON THE NORTH DOWNS.—Dr. Chapman, considerable series of the grasshoppers *Stenobothrus lineatus*, *Gomphocerus rufus*, *Chortippus parallellus*, *Stauroderus bicolor*, and *G. maculatus* from the North Downs escarpment and gave notes on their habits and habitats.

REVIEWS AND NOTICES OF BOOKS.

REMINISCENCES.*—A little recently published book, entitled *Raphael Meldola*, has just come into my hands, and has awakened almost forgotten memories of past times. The life-work of the late Professor Meldola is sympathetically dealt with by those who knew him in his various activities—as chemical investigator, professor, astronomer, and naturalist. As a chemist he will be remembered longest and with the most regret. His was the voice that warned Great Britain of the inevitable result of her neglect of this science. "Recognition," writes Professor Dalby, "came freely from foreign governments, from the Government of his own country, none." Yet, now that he is gone, he is recognised as one of the greatest research chemists of his day.

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* RAPHAEL MELDOLA. Reminiscences of his work and worth, by those who knew him, etc. Edited by James Marchant, with a Preface by Lord Moulton. Williams and Norgate, 1916.

But of my memories. In my earliest childhood I was initiated into the mysteries of entomology by Edward Boscher, of Twickenham. Edward Boscher and Meldola were life-long friends. Together they detected the presence of *Xanthia ocellaris* at Twickenham, in 1895, about the 6th record for Great Britain. And it was through Edward Boscher in later years that I got to know Professor Meldola, and discovered that we were fellow students at the College of Chemistry together, under Edward Frankland, in the "sixties," and that we were mutual friends of Roland Trimen, whom I perhaps last saw in his study at Cape Town Museum, in 1875. Just one point is missed in my little book, and that just the one point which Meldola would have had missed. Perhaps the fact is known only to myself. I feel it should not be lost. That is his munificent assistance to his old life-long friend in his time of old age and bitter adversity.

Both as a naturalist and as an entomologist Professor Meldola has a claim to our kindly remembrance. He was a Fellow of the Entomological Society of London from 1872. (President 1895-96, Vice-President five times, a member of the Council five times.) It is worth noting that Meldola was proposed for Fellowship of the Royal Society as a Biologist by Chas. Darwin—and not as a chemist. The bibliography in my little book records for 1869 three papers in the *Entomogist*, two entomological. Through the long years his contributions to the same magazine continued until 1913. Then he became involved in the great war, and his whole energies—to the sapping of his strength and life—were engaged in doing what he could—and could do so well—to save his country from the results of its neglect of the science of chemistry. Dr. W. G. Pope concludes his memoir with the remark, "the death of Professor Meldola must be counted amongst our war losses."—C.R.N.B.

[About a year before his decease the late Professor Meldola had joined the South London Entomological Society for the purpose he said of attending the field meetings and gaining the commune of the members to aid him in his recently taken-up study of the smaller British Lepidoptera. He was present at several of the field meetings during the year 1914 and members who took part on those occasions felt that not only had the Society gained numerically, but that a recruit had been obtained who was not only desirous of learning, but was also able to impart most useful all round information from long years of field work. Alas, the war, we must say, put an end to all our anticipations, and the Society loses; still greater is the country's loss!

In reading the above book I could scarcely believe it possible that I read aright. "Meldola was twice offered a decoration of the Legion of Honour—in 1900 and again in 1907. *On both occasions the Foreign Office forbad him to accept the distinction.*" (The Italics are mine). It is said that governments have no soul. That the governments of England should stoop to this amazing petty interference seems beyond belief. He was treated with the same brutal official contempt as was his beloved science.—H.J.T.]

THE TRANSACTIONS OF THE LONDON NATURAL HISTORY SOCIETY, 1915, 3/-.—This is another admirable Annual, and as usual contains a short summary of the exhibits at the ordinary meetings and the most important papers read. The former section comprises some dozen pages, the latter comprises over fifty pages. In addition there are numerous Reports on the work of the various sections of the Society. From a careful perusal of the latter, not only do the Society's energies comprise educational work, but a considerable amount of original observation and recording is undertaken. The President of the year, Dr. E. A. Cockayne, M.A., F.E.S., gave a most interesting and valuable address on "Insects and War," which included not only references to past wars, even as far back as the Greeks and Romans, but dealt with his own observations during the present war, and while on Government service. He concludes his address with these words, "And let us pay a tribute to the Bacteriologists and Entomologists who have unveiled the secrets of the lives of the parasites of these diseases and of their insect carriers, and to those who have applied their discoveries to preserve the health of our armies and so allow them to prosecute the war to a successful end."

Our colleague, Mr. A. Sich, contributes a paper entitled "A Hawthorn Hedge in Middlesex," in which he deals with the micro-lepidoptera as well as the macros. He speaks of the competition between the species for possession, of the casual visitors, even birds and molluscs, of the weeds at the foot of the hedge, and finally describes the hedge on a December afternoon with the contrast of its appearance on a May morning.

Possibly one of the most useful papers of the year is that by Mr. Harold B. Williams, "Notes on the Life-history and Variation of *Euchloë cardamines*," which occupies quite a quarter of the whole Transactions. It deals exhaustively with the most important matter hitherto published concerning the species, including the original description of Linneus, a summary of the characteristics of the imago, male and female, an account of the sexual dimorphism, a sketch of the lines and extent of variation hitherto noted, with the original descriptions of all named varieties. To those aberrations, etc., he adds ab. *flava*, "the ground colour of both fore- and hindwings of a bright canary yellow," ab. *caulotosticta*, "upperside forewing with the discoidal spot very large and branched, the upper portion being extended along the sub-costal vein towards the base," ab. *radiata*, "upperside forewing with a series of black dashes from the black apical spots towards, and in extreme specimens reaching, the discoidal," var. *hibernica*, "slightly smaller on the average than the type, the black spots at the ends of the nervures more strongly marked. The ♂ is frequently suffused with yellow on the underside of the forewing, the ♀ usually with the hindwing strongly suffused with yellow." Altogether some 34 varietal and aberrational names are listed. The author then deals with the teratological specimens, hybridity and gynandromorphism. Under the last heading a large number of examples are either referred to or described in detail. The next sections deal with egg-laying, the ovum, exclusion of the larva, description of the larva, habits of the larva, variation in the larva, a long list of food-plants, details of pupation, description of the pupa with details as to its variation. The records of the times of appearance includes the extreme dates February 29th (1896, Tunaley) and September 12th (1886, Haylock). Finally the paper concludes with a most interesting summary of the records as to the habits of the imago, made by Messrs. Tutt, Lucas, Main, Floersheim, Meldola, G. Marshall, Prideaux, etc. All our British entomologists should have a copy of this valuable paper before them.—H.J.T.

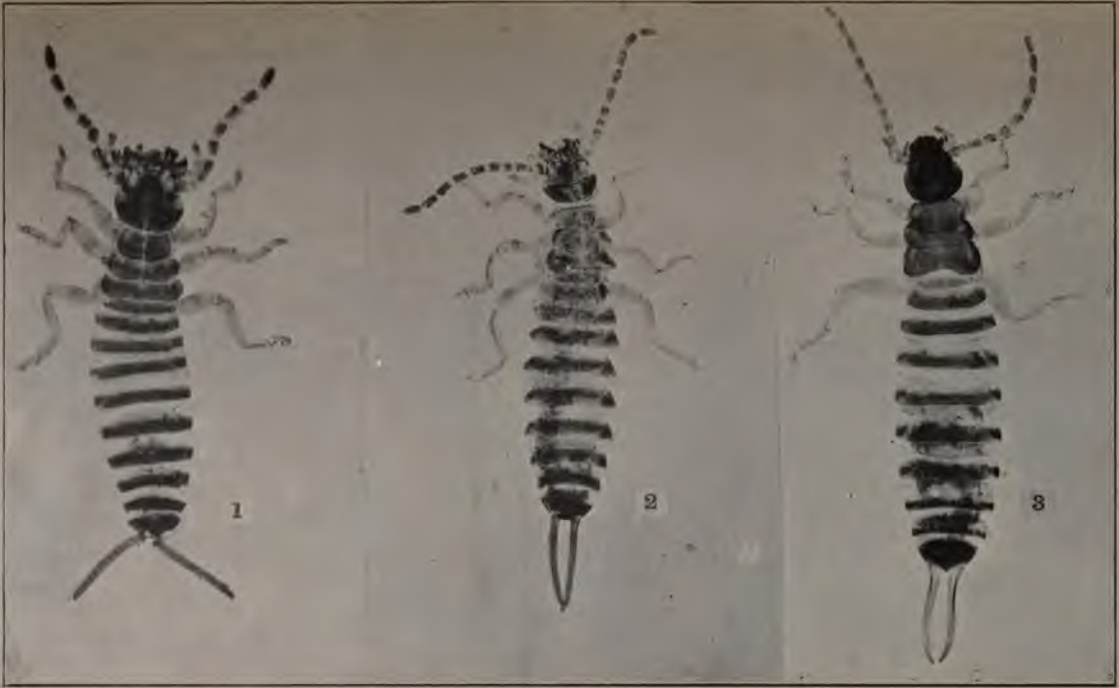
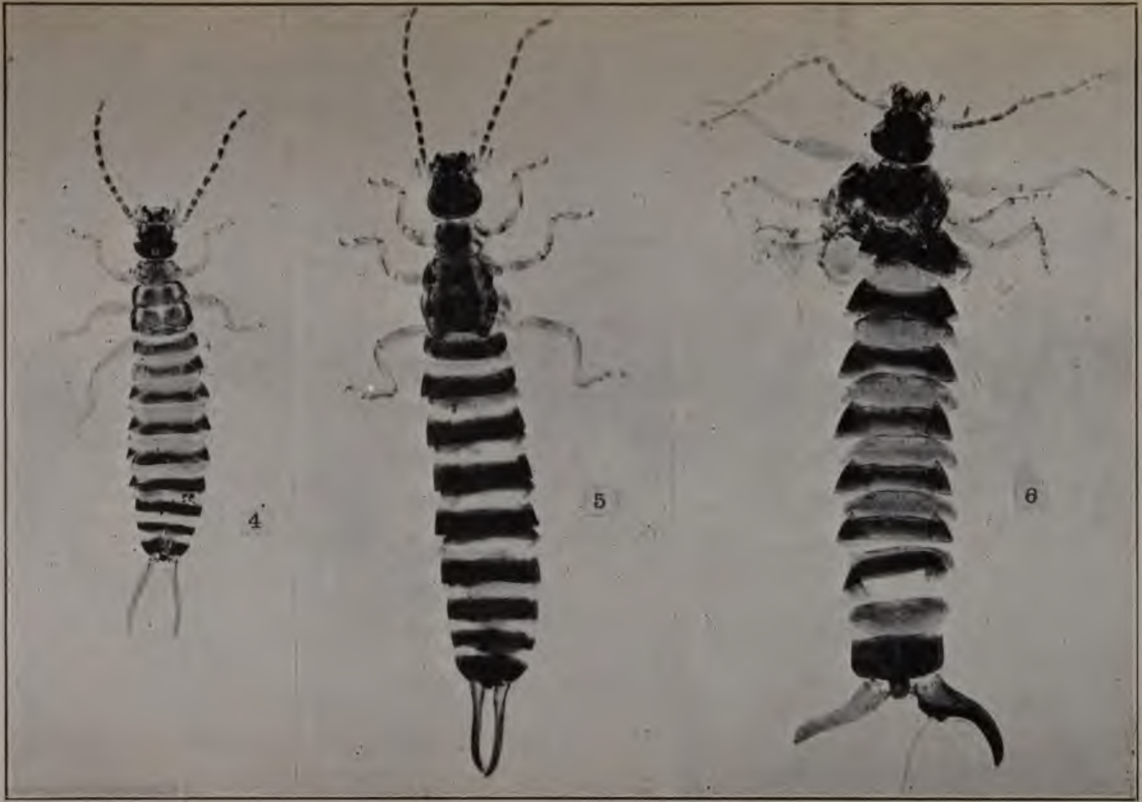


Photo. A. W. Dennis.

Early Stages of the Earwig.

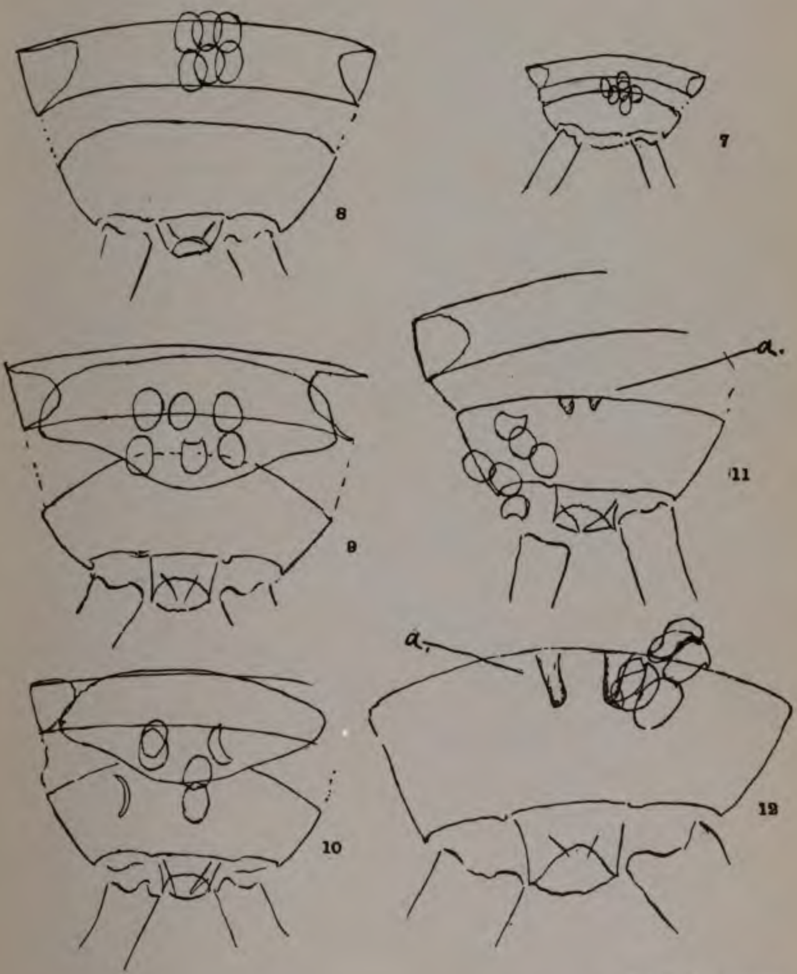
Fig. 1, 1st Instar × 8. Fig. 2, 3rd Instar × 6. Fig. 3, 4th Instar × 5.



Early Stages of the Earwig.

Fig. 4, 5th instar × 4. Fig. 5, 6th instar × 4. Fig. 6, 7th instar (imago) × 4.

Photo. A. W. Dennis.



Del. T. A. Chapman.

Early Stages of the Earwig.

(*Camera sketches of oval rings that are always present.*)

Fig. 7, 1st Instar.
Figs. 8, 9, 10, 5th Instar. ♀ (prob).
Fig. 11, 5th Instar ♂. *a*. process.
Fig. 12, 5th Instar ♂. *a*. process.
all × 26.

Notes on Early Stages and Life History of the Earwig (Forficula auricularia). (*With three plates.*)

By T. A. CHAPMAN, M.D.

Somewhere about 50 years ago I made some observations on earwigs, chiefly to the effect that the mother earwig kept her family at home, and carried in bits of grass and other food for them, and also that the number of joints of the antennæ increased as the young earwigs moulted. I did not then know that these facts were very imperfectly known and so took no accurate notes. These facts are better known now, but some recent notes on them may not be without value.

Last year, for the benefit of *Lycaena arion*, I had some ants nests in observation cases, and for the use of the ants I provided as provender, amongst other things, some earwigs. Some of these earwigs remained over, and two of them hollowed out nests and laid eggs, so I proposed to notice how the antennal joints multiplied at each instar. This was not altogether so easy as I imagined, especially as I had a certain amount of fear from some doubtful recollections of my earlier observations that undue interference might make the mother eat or destroy the young earwigs. From time to time I noticed bits of green stuff in the nest that must have been carried in by the parent earwig. The staple food of these earwigs was dandelion, on which they got on well enough, but a variation to grass, and especially, when available, to animal food, such as dead insects, seemed always acceptable. I never noticed any insect material carried into the nests.

The jars were filled about two inches deep with not very damp sand, and on it I laid bits of flat wood and cork, and under these the nests were made, they were simply hollows in the surface of the sand, with the cork as a roof. Naturally, no doubt, a stone usually serves this purpose, but if memory is to be trusted, the nests are perhaps more frequently excavated in the ground simply, deep enough to have a cover of the soil itself. The hollow was not large enough to take the earwig at full length in all its diameters. In one case, my frequent removal of the cover of the nest led the insect to enlarge the hollow obliquely downwards, so that there was not a complete exposure when the cover was removed, but the contents of the nest had a covering of sand, but could be seen imperfectly, by an oblique view. This extension was made whilst there were eggs and growing larvæ.

I did not count the number of eggs, but should guess about thirty, more or less.

There are six moults, and therefore seven instars, the adult imago being the seventh, or, if we include the egg as an instar, there are eight.

In the first instar the antennæ have eight joints. In the second and third they have ten, in one case there were nine in the second instar. This may have been correct, but I suspect that there is some probability it was the result of injury by its brethren, of this there is a further observation to note. In the fourth and fifth instars the antennal joints are eleven. In the sixth there are twelve, and in the seventh (mature) there are fourteen. Occasionally smaller numbers than these occur, but are almost certainly the result of injury. I have a specimen preserved in the first instar, in the interior of which are unmistakable portions of mandibles of that instar. As no moulting had occurred when this specimen was taken, they must have belonged to an insect and not to a cast skin ; there was therefore cannibalism, but whether the victim was attacked and killed with that object by its mother or its brethren, or whether it died naturally or by accident, cannot of course be decided. There was no obvious diminution in numbers, so that this occurrence must have been an exceptional one.

In the sixth instar the meso- and meta-thorax are produced in the wing region, showing that the wings are developing. I have not detected any external indication of wings in the fifth instar. The sexes can be distinguished in the fifth and sixth instars by external chitinous structures apart from the internal organs, (but, so far as I have examined the point, only after these chitinous structures are prepared for microscopical examination), beneath the large terminal dorsal plate. These are in the male apparently springing from its anterior border and extending backwards, two (one on either side of the middle line) short cylindrical processes, that appear to be internal, but the chitinous covers are cast on moulting, so they must be external. In the fifth instar these processes are very short, hardly longer than broad, perhaps to be called conical rather than cylindrical, in the sixth instar they are rather longer than half the length (antero-posterior) of the last plate that they are under. (Plate, III., Figs. 11 and 12.)

When the young earwigs had been some little time in their third instar, I found one morning in the case of one of the nests I reared, that all that remained of the mother earwig was her more or less disarticulated skeleton. She had been broken up and all the soft parts eaten by her brood ; in the case of the other nest the mother lay dead outside the nest, at the same stage of her brood ; these were plentiful round their dead mother, and wandering about the jar. Two days later the brood were found all collected in the nest, the remains of the female disarticulated and cleaned out. Both these broods attended to their own wants after this, apparently without difficulty and without any mortality.

The stage at which this occurred being the same in both instances, led of course to the strong suspicion that the old earwig was not only eaten, but first killed, by the children, as a customary proceeding. It is, however, very possible that in both instances she really died of old age. One may in any case, perhaps, assume that the young earwigs, numerous though they were, would have been helpless against her were her strength and energy not very much diminished. There were no indications that any of the brood had suffered in any defence she may have made.

That the mother dies as soon as her brood are large enough to find their own living seems very probable, from the fact that in June young earwigs may easily be found, but an imago is undiscoverable. This at least was my experience in 1916, the first imago of the season being found on July 14th. Exceptional individuals probably occur rarely, and the actual dates would vary in different years. Later, imagines are common, but examples in earlier instars get rarer and more rare, and are probably unfortunate individuals that have not been able to obtain enough nourishment to grow quickly, and may be also individuals of broods the mothers of which failed to make nests at the usual early date. I have met with no evidence that there is a second nest made by any female, or that the brood of the year make any nests till the spring of the following year. So far I have made no observations showing when the males perish.

There is one very remarkable item which I can report, but as to which I am quite unable to suggest any meaning or explanation, yet the structure observed is so constantly present that it must have some really important function. When first I noticed it I said at once this specimen, notwithstanding my method of preparing it and other difficulties and improbabilities, contains some unlaid eggs. What I saw was six oval lines in the last segment that has a narrow dorsal plate, the following one, the apparent last, being long and roughly triangular. These lines obviously suggested the outlines of eggs. The ovals were about 0·3mm. in their long diameter and 0·2mm. in the shorter. Closer examination suggested that they were only fine rings and belonged to nothing solid like an egg. The dimensions given are those in an adult specimen. The remarkable point about these rings is that they were present in every specimen examined (with one exception in a specimen somewhat differently disposed on the slide), at every stage from the first to the adult insect, and in both sexes, not only so, however, but also—and this is the point that puzzles me—they are equally present in all the cast skins at every stage.

They have all the appearance of being quite loose and free, sometimes at one side of the segment, or centrally, or on the other, placed as two threes, or as three twos, or each separate, trespassing often on the intersegmental membrane on either side of what appears to be their proper segment, or even sometimes in the next segment. This, one supposes one could understand in the actual insect, but the same remarks apply to cast skins, in which they must in some way be attached to their proper segment, but in a way permitting a certain amount of movement. They are nearly always expanded as ovals, but sometimes one or more has one side bent inwards, giving them a more or less crescent outline. Being cast with the skin at each moult implies that they are in some way dermal, or rather epithelial, structures. But this suggestion does not enable me to think I know anything further about them. Some of their varied aspects are shown on Plate III.

Looking over my notes, I see that some doubt may be possible whether there are really all the stages I mention, *viz.*, whether the 2nd and 3rd are not one instar, and whether the 4th and 5th are not also one instar, the doubt arises from the non-progression of the number of antennal joints, and that I may be in error is possible, say from a moult being spread over some time in the different members of a brood misleading me, owing to my fear of wrecking the whole research by too much disturbance for examination. Whether there is real ground for this doubt remains for future observations to determine.

This autumn I have secured a store of earwigs, to be kept over the winter to determine, if possible, some of the facts that want discovering or further elucidation. Such as, what is the truth as to the death of the mother earwig? some details as to regeneration of lost parts, when do the males die? and so on.

So far, I find that pairing takes place in late autumn and early winter, and probably occurs more than once. My jars are kept, at present, within doors, but pairing was observed only a day or two after they were established, so that there seems no reason to suppose that pairing was induced earlier than usual owing to a higher indoor temperature.

My bred specimens were kept a long time, but up to October no pairings occurred amongst them.

Dates are not perhaps of much value in regard to insects kept indoors, but I give some for what they are worth, *e.g.*, second nest, eggs laid April 21st, hatched May .10th. The third instar, mother died June 2nd. A census of my store of earwigs for the winter shows that I have 12 ♂s and 36 ♀s. They appear to live together very amicably, *i.e.*, they crowd together, but I have not only no deaths amongst them, but no evidence of their injuring each other.

The discrepancy in the numbers of the sexes may, or may not, show that there are more females than males normally, they were bagged without selection, just as they came.

The pairings amongst these specimens were observed when first the jars were looked into, at about 7.30 a.m. The disturbance, generally due to trying to get them in a better light, led to the insects, which were often well distributed about their domain, at once making off to get under cover and hide themselves, so that there were no doubt many more pairings than those actually seen. I noted—

October 26th.—7.30 a.m., saw a pair of earwigs *in cop.*, also two other pairs in which the males were apparently approaching the females. The females received their attentions very passively. The males bent their bodies so as to bring their forceps against the female, and in one case the male forceps had the female abdomen near its last segment between its blades, but not apparently holding it in any way, but rather gently stroking it. This observation was rapidly made as the insects soon made for cover.

October 27th.—This morning (7.30) there are two pairs *in cop.*, in both cases the attitude is the same. They are end to end, but each on what may be called opposite surfaces, so that if the dorsum of one be called upwards that of the other is downwards, and the forceps of each are against the ventral surface of the other.

October 28th, 7.50 a.m.—A pair seen *in cop.* in same attitude. These earwigs have been several weeks in captivity (jar I.), some that were taken only a few days ago (jar II.) have not been seen to pair. None have been seen paired after 8.30 a.m., by this time daylight drives them to shelter, where they probably do not pair, but if they do could not be seen without disturbance.

October 29th.—A pair this morning separated at once when exposed to full daylight.

November 2nd.—A very mild, calm, damp morning, four pairs seen in jar 1. They were in various attitudes, essentially that already described, but the necessities of foothold led to the male having a foothold under the female with the abdomen bent back, or to a foothold on the same surface, but with the abdomen twisted to bring it into the normal alignment.

One pair (the first seen) in jar 2:—

November 4th, 3 pairs seen in 1st jar.
" 5th, 1 " " 1st "
2 " " 2nd "

November 8th, 1 pairs seen in 2nd jar.
„ 15th, 1 „ „ 1st „
„ 16th, 1 „ „ 1st „
„ 20th, 1 „ „ 1st „

These latter records are no doubt faulty from a much less close scrutiny being kept on the jars.

Whatever function the forceps may have in courtship, they appear to have no prehensile or other office in pairing.

February 2nd, 1917.—A nest was made in jar I., and eggs were laid on or before December 12th. These hatched on January 9th to 11th, and the young larvæ are now apparently thriving. Other nests have been made since and eggs laid. The jars are in a warm room.

EXPLANATION OF PLATES.

PLATE I.

Fig. 1.—Earwig in first instar × 8. The antennal joints are 8 in number. The cerci are very straight and do not taper. The second joint of the tarsus almost persuades one that it is ankylosed to the first. The tarsi of the second and third legs have joints of nearly uniform thickness throughout, and the articulation of the 2nd and 3rd is over the full thickness of the joints, just as the 1st and 2nd is. But the tarsus of the 1st leg has the 2nd joint a little produced ventrally, and the 3rd joint has a narrow articulation to it towards its dorsal margin. This is the structure of the tarsus of all the legs in all the following instars, *i.e.*, articulation 1st to 2nd full width of joints, but 3rd joint tapered proximately and with a small articulation to dorsal margin of 2nd.

The specimens from which these photographs are taken are not too successfully mounted for that purpose, and those of the 2nd instar were decidedly not good enough, so that we have in

Fig. 2.—Third instar, × 6, the antennæ have ten joints, and all the tarsi are as referred to above. The cerci are still rather straight and of uniform thickness.

Fig. 3.—Fourth instar, × 5. Antennal joints 11, in this specimen the right antenna has only 10, the last joint appears to be a normal last one, the third joint is rather longer than on the other side, showing a probable intention to add another joint. The cerci show something of the adult curving and tapering.

PLATE II.

Fig. 4.—Fifth instar, × 4. Antennal joints 11.

Fig. 5.—Sixth instar, × 4. Antennal joints 12. The second and third thoracic segments show the extension to accommodate the developing wings. At this (pupal ? or penultimate) stage, the cerci seem to be about the same in both sexes.

Fig. 6.—Seventh (imaginal) instar, × 4. Elytra and wings shortened or removed. Antennal joints 14. This specimen is chosen notwithstanding its defects as showing cerci suggesting hermaphroditism, the one that looks like a female is, from its appearance, with but little doubt a regenerated one, that wanted another instar to become normal, in other words, the loss of the appendage occurred during an iustàr at least one too late for complete regeneration to occur by the time the imaginal stage was reached.

PLATE III.

Camera sketches to illustrate the appearance of the oval rings found in all stages and in the cast skins. It is remarkable that they were never lost in preparing and mounting specimens, either of the insects themselves or their cast skins. But the variety in their disposition may be due to this cause, in no two specimens are they placed exactly alike. In one specimen only are they absent, it shows no definite damage in mounting by which they might have escaped. Fig.

11, however, shows some apparently escaping where one of the cerci has been partially separated. All × about 26.

Fig. 7.—First instar.

Figs. 8, 9, 10.—Fifth instar. Probably ♀ ♀ ♀.

Fig. 11.—Fifth instar. Male.

Fig. 12.—Sixth Instar. Male. In these two, *a* points to the processes found in male larvæ at these stages.

Myrmecophilous Notes for 1916.

By H. DONISTHORPE, F.Z.S., F.E.S.

FORMICIDÆ.

MYRMICINÆ : *Myrmecina graminicola* Latr. The interesting colony of this species, which I have now had under observation in captivity for over six years [see *Brit. Ants*, p. 81 ; *Ent. Rec.* **28**, 1 (1916)] continues to flourish. For the second year a number of winged females and some males have been produced, and to-day (January 25th, 1917) very many larvæ are present ; and one packet of eggs, laid as I believe by the original queen.

On April 27th, the first imago to appear was a cripple ♀, with bent antennæ and deformed wings. Her wings were removed by the old ☿ ☿ and dealated ♀ ♀ ; she was frequently dragged about, and died on May 3rd.

On May 7th, a perfect winged ♀ emerged, and by the 12th over a dozen were present, and others continued to appear up to the end of June—quite 50 winged females being produced. Sooner or later they all removed their wings, the last female with wings being observed on November 20th.

On May 20th, three ♂ ♂ had appeared, and by June 4th some eight were present, about fifteen in all being reared. One is tempted to think that the males were produced from eggs laid by the 1915 virgin ♀ ♀, as at one time a number of small egg-masses were present among the larvæ. The larvæ are always spread out over the floor of the second dark chamber of the nest, and the ☿ ☿ and dealated ♀ ♀ rest upon them, the old queen's eggs being in the centre.

Copulation took place between the ♂ ♂ and ♀ ♀ in the nest. This was first noticed on June 23rd, when a ♂ was observed *in cop.* with a deälated ♀ ; they were firmly fixed together (the ♂ sometimes resting on the back of the ♀, and sometimes being dragged along on the ground behind), and remained in this condition for some hours. A single ☿ appeared to be in attendance on them. On June 24th another male was *in cop.* with a winged ♀, this pair separated more quickly, and other ♂ ♂ were observed *in cop.* on June 30th, July 8th, and July 21st, all with winged ♀ ♀.

On June 25th a male was dead, and by August 30th nearly all the ♂ ♂ were dead, and most of the ♀ ♀ were deälated. At times the males were very lively, hurrying and partly flying about the nest. The ♀ ♀ both before and after they have removed their wings, behave exactly as do the ordinary workers ; they help to move, feed, and clean the larvæ, kill and cut up small insects given to them, etc. The colony was supplied with plenty of animal food, insects (chiefly flies), larvæ, etc.

Professor Emery has published some interesting notes on Polymorphism in *Myrmecina graminicola* [*Acad. Sci. Ist. Bologna*, **1916**, 56-9, Tf. 2·1-5]. He has found that macrergates occur, and that a complete transition exists between the normal ☿ and normal ♀, and he states he considers a form captured by Kutter at the foot of the Alps in Switzerland, and described by Forel as a new species—*M. kutteri* [*Mitt. Schweiz. Ent. Ges.*, **12**, 21 (1915)] is in fact one of these intermediate forms, and should be regarded as an aberration of *M. graminicola*.

I sincerely trust it will never become a recognised practice to name aberrations in ants! Of course it was not intended in this case, but should such a fashion arise it would encumber our nomenclature with names without end.

Myrmica laevinodis Nyl. On October 11th I captured in my garden at Putney an ergatandromorph of this species; my attention being drawn to the ant by the curious "jerky" manner in which it walked. I have now drawn up the following description :—

Mixed Ergatandromorph.

Head, thorax, first segment of gaster, and a streak on left anterior, right intermediate and two posterior femora blackish-brown, all the rest of insect pale yellowish-red. General appearance worker.

Head chiefly ☿, right side slightly more swollen, and right *eye* a little larger than left; two *ocelli* present (median and left lateral); *antennæ* 12-jointed, ☿. *Thorax: pronotum* distinct; *mesonotum* high, but not as broad as in ordinary ♂, more swollen on right side, with a short chitinous tubercle similar to the vestigial wings to be found on pterergates, bounded at base by a deep hollow, where the scutellum of the ♂ would be; right *Mayrian furrow* present; *epinotum* long as in ☿, furnished with ☿ spine on left side, and ♂ tubercle on right. *Petiole* and *post-petiole* ☿; *gaster* with 4 segments, slightly more swollen on right side. *Legs* ☿. *Long.* 5mm.

This is the 35th gynandromorphous ant yet recorded, the 9th British specimen, the 9th *Myrmica*, and the 8th specimen described by me. For a complete list of these curious pathological phases, previous to the one just recorded, see *Ent. Rec.*, **27**, 259-60 (1915).

Myrmica scabrinodis Nyl., var. *sabuleti* Mein. On June 17th a large colony of this variety was found at Bewdley, situated in one half of a mound constructed by *Acanthomyops* (*Chthonolasius*) *flavus*. This is the first record of this variety for Worcestershire.

Myrmica schencki Emery. On September 15th I went to stay with my friend Mr. Hallett, at Penarth, and the next day he kindly conducted me to the bank at Sully where he discovered this species new to Britain in 1915 [*Ent. Rec.*, **27**, 265-6 (1915); *Trans. Cardiff, Nat. Soc.*, **48**, 73 (1916)].

After some search three colonies were found in different parts of the bank. Evidently the marriage flight had occurred previously, as no winged ♀♀ were found, and only ☿ pupæ and larvæ were present. Fortunately, however, two ♂♂ were secured, as this sex had not previously been found in Britain. A deälated ♀, and a number of ☿☿ were collected alive for observation purposes. The only myrmecophile present was *Beckia albinos*.

When I arrived home, on September 22nd, most of the ☿☿ appeared to be quite dead, no doubt on account of the want of air in the rather small bottle in which they had been placed. Nearly all of them revived, however, when introduced into a damp "Janet" nest, and they and the queen are all well to-day, although no eggs have been observed to be laid.

I append a description of the male:—

♂ *Deep blackish brown, shining; tarsi yellowish; club of antennæ and articulations of joints of legs yellowish-brown.*

Head striate longitudinally, closely punctured between the striæ, with a deep impression on front, just above median ocellus; *antennæ* with *scape* slightly bent, short, not longer than the first three joints of funiculus taken together, *funiculus* slender, with a more or less 5-jointed *club*. *Thorax*: *mesonotum* smooth and shining between the Mayrian furrows; *scutum* towards base and *scutellum* longitudinally striate; *epinotum* rather widely longitudinally striate, with somewhat sharply pointed tubercles, space between smooth and shining. *Petiole* finely punctured; *post-petiole* smooth and shining. *Legs* slender. *Wings* as in ♀. *Long.* 5mm.

From *M. lobicornis* it may be at once recognised by the much shorter scape of the antennæ; from *M. scabrinodis* and the var. *sabuleti* it may be known by its more strongly and closely punctured, less shining head, considerably less stout antennæ and legs, and shorter exserted hairs on the tibiæ and other parts.

CAMPONOTINÆ.

Acanthomyops (*Dendrolasius*) *fuliginosus* Latr. A colony of this ant had been established for some years in a decayed gate-post in my friend Mr. Morice's garden at Woking. Having decided to put in a new post, he asked me to come down and stay with him and help dig up the old one. Accordingly, on May 7th, I went down to Woking and assisted in digging it up.

Very little carton occurred, it only being present round the bottom of the post underground, and in a few of the cracks in the wood. The wood in the centre of the post was not decayed, but was tunnelled by numerous borings and cracks, and here the bulk of the ants and their larvæ were housed. A queen, with very distended gaster, was found in a small hollow under a knot in the centre of the post, surrounded by a large court of ☿ ☿. The queen was taken home with a large number of ☿ ☿, myrmecophiles, and pieces of wood from the post. She was established in a large four-chambered "Janet" nest with ☿ ☿ and bits of wood, and the rest of the wood, ants, etc., were placed in a very large glass bowl. From this bowl the nest was reinforced from time to time with ☿ ☿, larvæ, and myrmecophiles, which collected under the pieces of wood.

A number of privet petals were found in and around the post, and Morice told me he had often observed the ants carrying these fallen petals towards their nest and taking them down the holes and cracks round the bottom of the post. What the reason for this was I do not know, unless these petals were used in some way in the construction of carton.

The following myrmecophiles were found when digging up the post, or bred later in the bowl:—COLEOPTERA: *Myrmedonia funesta*, scarce; *M. laticollis*, bred in some numbers later; *Amphotis marginata*, in *very great* numbers, all sizes. ACARINA: *Antennophorus grandis*, common on the ants; *Laelaps cuneifer*, not uncommon; *Trachyuropoda bostocki*, in fair numbers; *Urodiscella philoctena*, not common, on the strigils of the ants, in a few instances one occurred on both strigils of a single ant.

The wood-louse, *Platyarthrus hoffmanseggi* was common, but the Collembola, *Beckia albinos*, was scarce. The egg-sacs of the spider *Tetrilus recisus* were fairly abundant, fastened to bits of wood in the centre of the post, and a number of Lepidopterous cocoons (*Œcophoridae*) were also present in the cracks in the wood among the ants. Some hatched later, and Durrant tells me the moths are *Endrosis lactella*, Schiff.

I believe this colony of *fuliginosus* was founded in a nest of *Acanthomyops* (*Chthonolasius*) *umbratus*; that is to say a female *fuliginosus* (which species occurs all round Woking) had entered a nest of *umbratus*, had been accepted and brought up her brood, the *umbratus* having eventually all died off. Morice tells me that *umbratus* does, or has, occurred in his garden, he has noticed a marriage flight, and has seen this ant not far from the gate-post in question. The acari *T. bostocki* and *U. philoctena* are the normal guests of *umbratus*, and Berlese does not record either of them with *fuliginosus* in his monograph on the myrmecophilous Acarina [*Redia*, **1**, 458 (1903)]. It is true that I have once taken *T. bostocki* with *fuliginosus* in the Isle of Wight [*Ent. Rec.*, **26**, 44 (1914)], but I should say that colony also had an *umbratus* origin. Wasmann [*Tijds. v. Entom.*, **58**, 158 (1915)], records a case where over 100 *Claviger longicornis* (the normal host of which is *umbratus*) were found in a nest of *fuliginosus* in which a few *umbratus* ☿ ☿ were still present, and he accounts for the presence of the beetle through the colony-founding habits of the ♀ *fuliginosus*. For a complete account of the colony founding of this ant see *Brit. Ants*, pp. 196-9.

The virgin *fuliginosus* ♀ recorded by me last year [*Ent. Rec.*, **28**, 2-3 (1916)], as being accepted by the ☿ ☿ in my *umbratus* nest is alive and well to-day. By April 22nd, her gaster had commenced to swell, and on May 25th she laid a few eggs. On June 9th, a larger packet of eggs was present, held up, in one mass, by several ☿ ☿. On May 25th, two small larvæ had hatched, the eggs having taken over two months to develope! As is well known parthenogenetic eggs always take longer to hatch, than do ordinary ones. The eggs continued to hatch very slowly, and on November 28th, some fifteen small larvæ were present and all the eggs had disappeared. To-day (January 28th) I can count ten medium sized larvæ, and the *fuliginosus* ♀ is surrounded by a court of *umbratus* ☿ ☿. If I can only rear these larvæ, it will be very interesting to see whether they produce ♂ ♂, or ☿ ☿.

(*To be concluded.*)

The Coloration Problem. II.

By W. PARKINSON CURTIS, F.E.S.

(*Continued from page 11.*)

7. **Emberiza cirlus**. The Cirl Bunting.

OBSERVER.—W. P. Curtis. TIME.—Afternoon.
DATE.—August 20th, 1916. SEX.—♀.
PLACE, Anvil Point, Dorset. DURATION.—Casual.

FOOD.—*Leucania pallens*. The bird popped out of long grass very close to me, with the insect in its bill. I had a good view as it sat on a telegraph wire close to me. The pair were feeding young, and I afterwards saw the ♀ with what looked like *Polyommatus icarus*, or perhaps 2nd brood *Agriades thetis* (*bellargus*), but I believe the former. We tried for upwards of an hour to get some satisfactory observations, but the parents were feeding young out of the nest over a scattered area, and we had no glasses, so were baffled.

8. **Certhia familiaris** race **britannica**, Ridg. The British Tree Creeper.

Observer.—E. H. Curtis.	Time.—afternoon.
Date.—May 22nd, 1915.	Sex.—?
Place.—Canford, Dorset.	Duration.—Casual.

Food.—*Panagra petraria*, held by the abdomen; the insect was quite dead. The incident led to the discovery of the nest on which the following observations are made.

Observer.—W. P. Curtis.	Time.—Afternoon.
Date.—May 23rd, 1915.	Sex.—As below.
Place.—Canford, Dorset.	Duration.—2¾ hours.

[Note.—The sexes of the birds are given with great reserve, and are based on behaviour, as I found myself quite unable to distinguish the sexes, even after examining my skins of the birds. Henry Seebohm, "Brit. Bird.," I., 212 (1886), says sexes do not differ in colour.]

Time.—2.2. Sex.— ?
Food.—Unidentified.

Time.—2.5. Sex.—♂.
Food.—Green larva.

Time.—2.30. Sex.—♂ and ♀.
Food.—Unidentified.

Time.—2.35. Sex.—?
Food.—Unidentified.

Time.—2.40. Sex.—?
Food.—Four small grey moths. Query, *Scoparia* or perhaps a *Sericoris*.

Time.—3.7. Sex.—?
Food.—Woodlouse.

Time.—3.15. Sex.—?
Food.—Unidentified.

Time.—3.17. Sex.—?
Food.—Unidentified.

[Note.—Had trouble with shutter and changed lenses, time wasted nine minutes.]

Time.—3.26. Sex.—?
Food.—Unidentified.

Time.—3.28. Sex.—?
Food.—Lepidopterous larvæ.

Time.—3.30. Sex.—?
Food.—Two *Lobophora halterata*. (After I got back and thought these insects over carefully I felt a bit nervous as to whether they might not be *Tephrosia punctularia*, but finally adhered to above. The difficulty is one gets an odd wing or two at an angle for a fraction of a

second, and then has to make the best one can of the shape and pattern.)

Time.—3.45. Sex.—♂.
Food.—A whole beakful of non-lepidopterous insects (from the negative these seem to be ants with a liberal mixture of *Arachnidae*).

Time.—3.48. Sex.—♀.
Food.—Unidentified.

Time.—3.55. Sex.—♀.
Food.—Unidentified.

Time.—4.12. Sex.—?
Food.—About a dozen Hymenoptera and Diptera.

Time.—4.30. Sex.—?
Food.—Unidentified.

Observer.—W. P. Curtis. Time.—Afternoon.
Date.—May 24th, 1915. Sex.—As below.
Place.—Canford, Dorset. Duration.—3 hours 40 minutes.

[Note.—This was a somewhat disturbed series of observations, besides Boy Scouts I had trouble with my hiding tent, which was not set nicely owing to ancient tree stumps, and the birds had three ways into the nest. I had to come out twice to stop modes of ingress and egress that withdrew them from scrutiny.]

Time.—1.35. Sex.—♀.
Food.—Unidentified.

Time.—1.47. Sex.—♂.
Food.—Unidentified.

Time.—1.52. Sex.—?
Food.—A beakful of small grey moths; appeared to be *Tortrices*.

Time.—1.53. Sex.—?
Food.—A similar beakful.

Time.—2.0. Sex.—♂ and ♀.
Food.—Unidentified.

Time.—2.4. Sex.—♂.
Food.—Lepidopterous larvæ mostly *Geometrae*.

Time.—2.20. Sex.—♂ and ♀.
Food.—All small insects. ? Order.

Time.—2.24. Sex.—♀.
Food.—Unidentified.

Time.—2.31. Sex.—♂.
Food.—Unidentified.

Time.—2.38. Sex.—♂ and ♀.
Food.—Unidentified.

Time.—3.4. Sex.—?
Food.—3 or 4 Diptera and *Nemophora swammerdammella*.

Time.—3.23. Sex.—♂.
Food.—A whole beakful of insects. ? Order.

Time.—3.25. Sex.—♀.
Food.—Larvæ and insects.

Time.—3.35. Sex.—?
Food.—Larvæ.

Time.—3.38. Sex.—♀.
Food.—Woodlice.

Time.—3.45. Sex.—♂.
Food.—Unidentified.

Time.—3.55. Sex.—♂ and ♀.
Food.—Unidentified.

Time.—4.10. Sex.—?
Food.—A mouthful of insects and two small moths (? Family).

Time.—4.20. Sex.—♂ and ♀.
Food.—Unidentified.

Time.—4.22. Sex.—♂.
Food.—Larvæ.

Time.—4.30. Sex.—♂.
Food.—Unidentified.

Time.—5.5. Sex.—♀.
Food.—Unidentified.

[Note.—Total 44 records. Food brought every time. Food iden fied 19 times. Insect food every time. Lepidopterous imagines broug 7 times. Unfortunately I was unable to fix accurately on every occ sion the number of Lepidoptera brought, which is extremely regrettable

9. **Parus major** race **newtoni**, Prazate. The British Gre Titmouse.

Observer.—W. P. Curtis. Time.—Afternoon.
Date.—June 15th, 1913. Sex.—As below.
Place.—Berewood, Dorset. Duration.—55 minutes.

Time.—4.10. Sex.—♀.
Food.—None.

Time.—4.12. Sex.—♀.
Food.—A sizeable whitish Geometer, looked like *Melanippe mont nata*.

Time.—4.15. Sex.—♂.
Food.—Unidentified.

Time.—4.18. Sex.—♀.
Food.—Another Geometer moth like the last. (I got a negative this but it is no help.)

Time.—4.20. Sex.—♀.
Food.—*Cabera exanthemata.*

Time.—4.27. Sex.—♀.
Food.—Small green larva. ? *Hibernia marginaria* (this was m note at the time. I think *H. leucophaearia* is right).

Time.—4.27. Sex.—♂.
Food.—Unidentified.

Time.—4.30. Sex.—♀.
Food.—Unidentified.

Time.—4.34. Sex.—♀.
Food.—Unidentified.

Time.—4.34·30. Sex.—♂.
Food.—Larva of *Oporabia dilutata.*

Time.—4.37. Sex.—♂.
Food.—Small black beetle.

Time.—4.40. Sex.—♀.
Food.—Unidentified.

Time.—4.41. Sex.—♂.
Food.—Small black beetle.

Time.—4.43. Sex.—♂.
Food.—Small black beetle.

Time.—4.46. Sex.—♀.
Food.—Unidentified.

Time.—4.47. Sex.—♂.
Food.—Unidentified.

Time.—4.50. Sex.—♀.
Food.—Insect imago. ? Order.

Time.—4.50·30. Sex.—♂.
Food.—Unidentified.

Time.—4.50·45. Sex.—?
Food.—More small black beetles. I found they were getting these by tearing loose bark off the rotten limbs of the oak on which the nesting box was fixed.

Time.—4.51. Sex.—♂ and ♀.
Food.—Small insects. ? Order.

Time.—4.53. Sex.—♂.
Food.—Small black object. ? Woodlouse.

Time.—4.54. Sex.—♀.
Food.—Small whitish Geometer, looked like *Lobophora sexalisata.*

Time.—4.50·30. Sex.—♂.
Food.—Small green *Noctua* caterpillar. ? *Taeniocampa pulverulenta* (*cruda*).

Time.—4.55. Sex.—♀.
Food.—Too quick.

Time.—4.56. Sex.—♂.
Food.—Small, blackish, round object. ? Woodlouse.

Time.—4.56. Sex.—♀.
Food.—Either a small green beetle or a green Hemipteron.

Time.—4.57. Sex.—♀.
Food.—Bluebottle fly.

Time.—4.58. Sex.—♂.
Food.—Something like a beetle, really too quick to see.

Time.—4.59. Sex.—♀.
Food.—Whitish Geometer, looked like *Melanippe montanata.*

Time.—4.59·30. Sex.—♂.

FOOD.—Either a bluebottle fly or a small beetle.

TIME.—5.1. SEX.—♂.
FOOD.—Small fly.

TIME.—5.2. SEX.—♀.
FOOD.—Small round object, almost certain this was a woodlouse.

TIME.—5.3. SEX.—♀.
FOOD.—*Cheimatobia brumata* larva.

TIME.—5.5. SEX.—♂.
FOOD.—Small black beetle.

OBSERVER.—W. P. Curtis. TIME.—Morning.
DATE.—December 21st, 1913. SEX.—?
PLACE.—Canford, Dorset. DURATION.—Casual.

FOOD.—I saw a bird going carefully over the trees and taking off the dead leaves which still adhered by the petioles, and holding them by one foot examining them with great care, and then dropping them. Was it looking for pupæ or hibernating larvæ?

[NOTE.—Total, 35 records. Food brought 33 times. Food identified 24 times. Insect food every time. Lepidopterous imagines 5 times. It should be observed that the moths were brought by the ♀ alone.]

10. **Parus ater** race **britannicus**, Sharpe and Dresser. The British Coal Titmouse.

OBSERVER.—E. H. Curtis. TIME.—?
DATE.—June 29th, 1913. SEX.—?
PLACE.—Bere Wood, Dorset. DURATION.—Casual.

FOOD.—*Tortrix viridana*, captured in a tree, difficult to say whether at rest or not, but the balance of evidence is strongly in favour of former.

OBSERVER.—E. H. Curtis. TIME.—Afternoon.
DATE.—May 24th, 1915. SEX.—♂ and ♀.
PLACE.—Canford, Dorset. DURATION.—2 hours.

FOOD.—E.H.C. found himself unable to distinguish sexes satisfactorily. 17 visits to nest. Food on 16 occasions, green Lepidopterous larvæ, once unidentified.

OBSERVER.—E. H. Curtis. TIME.—Afternoon.
DATE.—May 21st, 1916. SEX.—♂ and ♀.
PLACE.—Canford, Dorset. DURATION.—2¼ hours.

FOOD.—34 visits to nest. Food identified on 5 occasions, 4 times green larvæ, once a Coleopteron.

NOTE.—Total, 52 records. Food brought every time. Lepidopterous imago once. This bird seems very inconclusive from the above records, but we were prevented from giving either nest further attention.

(*To be continued.*)

Bibliography of Pieris napi, its forms and close allies.

By Hy. J. TURNER, F.E.S.

(Continued from page 158.)

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1869. Boisduval.—" Lep. Californ.," p. 39. o.d. *resedae.*
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1871. Newman.—" Brit. Butt.," p. 160, figs.
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1873. Schilde.—" Stett. e. Zeit.," vol. xxxiv., p. 169.
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1873. Butler.—" Cist. Ent.," vol. i., p. 173. o.d. *megamera.*
1874. Moschler.—" Stett. e. Zeit.," vol. xxxv., p. 153.
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1875. Weismann.—" Stud. Desz-thr.," vol. i., p. 29-32, plt. i.
1876. " Pet. Nouv. Ent.," p. 155.
1877. Grum-Grshimailo.—" Hor. Ross.," vol. xii., p. 301. o.d. *tadjika.*
1878. Kirby.—" Eur. Butt. and Moths," p. 7, pl. iv.
1880. Oberthür.—" Études," vol. v., p. 13. o.d. *orientis.*
1880. Frey.—" Lepid. Schw.," p. 4.
1880. Taschenberg.—" Prak. Ins.-Kund.," vol. iii., p. 11.
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(To be concluded.)

NOTES ON COLLECTING, Etc.

HYDRŒCIA CRINANENSIS AT BURNLEY.—Looking over some *Hydroecia* material the other day with Lc.-Corp. Wolley-Dod, we found a specimen of *H. crinanensis* labelled " W. G. Clutten, Burnley, 1900." As this is the second English record for the species it seems worth recording. The former was, " Bolton, Lancs., J. E. R. Allen, 1897."—C.R.N.B.

CURRENT NOTES AND SHORT NOTICES.

Enquirers as to the authorship of Current Notes please note :—" CURRENT NOTES are, as a rule, contributed by the Acting Editor who is responsible for them. Those contributed by the other Editors or by correspondents have their initials attached."—*Ent. Record*, vol. xxiv., p. 128 (1912) and vol. xxv., p. 236 (1913). Contributions to this column would be welcome.

We are pleased to state that Lieutenant Noel Stanton Sennett, F.E.S., who was badly wounded in the arm during the " big push " in November, is progressing favourably. He was struck by a shell after he had reached the 5th, German line. During this engagement over two miles of German trenches were captured by the British. He had previously been all through the disastrous Gallipoli campaign, and was then sent to France without any leave ; having been on constant active service for over twelve months.—H.D.

We have on several occasions referred to the apparent disappearance of *Pararge aegeria* in many of its old haunts particularly around London. The Annual Address to the Hertfordshire Natural History Society by the President, Mr. A. E. Gibbs, F.L.S., deals with this subject in considerable detail under the title, "The Satyrid Butterflies of Hertfordshire, with a short study of *Pararge aegeria*," illustrated by a coloured plate of the main forms of both sexes. The author suggests the causes of such disappearance as: (1) The extension of urban areas. (2) Attacks of insectivorous birds and mammals on the larvæ which are grass feeders. (3) Imagines of weak flight and hence more susceptible to attacks by birds, but on the other hand of not striking coloration. There was no scarcity of food and the suggestions he gave seemed to him by no means satisfactory. Each Satyrid species is considered in detail. Three species are now practically absentees, *Satyrus semele*, *Pararge aegeria* and *Melanargia galathea*. The last named used to occur at Tring, of the first there are only two records for Hertfordshire. In dealing with *Pararge aegeria* Mr. Gibbs takes the following points. (1) Local history and records of the species down to the present time. (2) Recent records in other counties bordering on the Metropolis. (3) Distribution as given by the earlier British authorities such as Stephens. (4) The range of the species abroad. (5) A discussion of the facts dealing with the two main forms *aegeria* and *egerides*. (6) Consideration of other named forms or closely allied species. (7) Pre-Linnean references to the species, beginning with a doubtful one of Aldrovandus 1602. (8) Nomenclature, dealt with somewhat in detail, in which he points out that *tircis*, Ernst and Engr., is the prior name for the *egerides*, Staud. form. This is an admirable model of an address for a provincial society. The subject was quite scientific but its presentation was so replete with local and personal reference that interest at no time wearied, as it often does on the occasion of these annual orations.

News has just come to hand of the decease of Mr. C. O. Waterhouse, at the age of 73.

The December number of the *Entomologist* has figures of two striking aberrations of *Arctia caia* bred from larvæ obtained in the Scilly Islands last May by Mr. F. W. Frohawk. In one specimen the forewings are entirely chocolate-brown except the small basal white spots and slight traces of darker markings here and there.

The *Ent. Mo. Mag.* for December contains a plate in black and white illustrating Mr. G. C. Champion's concluding article on Exotic *Scraptiina* (Coleoptera).

In the December number of the *Ent. News* are several interesting articles on "other Orders," including (1) "Some Ectoparasites of Bats (Diptera)," with two plates, by G. F. Ferris. (2) "A Study of the *lateralis* group of the genus *Villa-Anthrax* in pt. (Dipt.)," by E. J. Cresson. And (3) Descriptions of new Aphids with two capital plates of details of structure by Messrs. Gillette and Bragg. A number of new species of *Geometridae* from California are described by W. L. Wright in the same number.

Mr. G. T. Bethune-Baker has written a useful critical note on the Lycænid Genus *Hemiargus*, Hübner, in the December number of the *Ent. News*. He has given notes on the species contained in the genus in Dyar's List, including the results of his careful examination of the types in the Boisduval collection kindly lent to him by Monsieur Charles Oberthür.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

November 1*st*, 1916.—Election of Fellows.—Messrs. Hassan Efflatoun, Choubrah Avenue, Cairo, Egypt, and S.E. Agricultural College, Wye; Frank Hannyngton, Mercara, Coorg, S. India; Harry Haden May, Blackfriars House, Plymouth; and Akio Norhira, Tchijoji, Otagigun, Kyoto, Japan, were elected Fellows of the Society.

An observation by Mr. C. O. Farquharson on the Hesperid Butterfly, Rhopalocampta forestan, Cram.—Prof. Poulton gave an account of the observations described in a letter by Mr. Farquharson who had observed on the arm of a verandah chair, in his house at Ibadan, a specimen of the Hesperid butterfly *Rhopalocampta forestan*, Cram., eagerly sucking up a drop of liquid from the surface of the chair arm, and was astonished to see it push forward the slightly incurved abdomen to within a few millimetres of the end of its proboscis, and eject a drop of clear fluid, which was absorbed in a few seconds, this proceeding being repeated several times.

Man attacked by a Tabanid Fly of the genus Pangonia on the wing.—Prof. Poulton exhibited a specimen of a Tabanid fly, probably a form of *Pangonia oldii*, Aust., referred to in a note by Dr. G. D. H. Carpenter, which had attacked his arm while on the wing.

Mallota cimbiciformis, Fln., bred from rotten wood.—He also exhibited examples of *Mallota cimbiciformis* bred by Mr. H. Britten of the Hope Department.

Pteronus sertifer, Geoff., bred from Pine.—The Rev. F. D. Morice exhibited specimens of *Pteronus sertifer* ♂ ♂ and ♀ ♀, and read notes.

A very rare Neuropteron.—Mr. G. T. Porritt exhibited specimens of *Sympherobius striatellus*, Klap., and of *S. elegans*, Steph., for comparison.

Gynandromorphous Lepidoptera, etc.—Mr. G. Talbot exhibited on behalf of Mr. J. J. Joicey:—(1) A gynandromorph of *Papilio lycophron*, race *phanias*, R. and J., from North Peru. (2) *Polygrapha cyanea*, G. and S., the unique and hitherto undescribed female, apparently a mimic of *Opsiphanes*. (3) A hybrid gynandromorph of *Amorpha populi* × *Smerinthus ocellatus*.

Papers.—The following papers were read:—

"Further notes relating to the origines of the Jurinean Genera of Hymenoptera," by the Rev. F. D. Morice, M. A., F.E.S., and J. Hartley Durrant, F.E.S.

"On a collection of Heliconine forms from French Guiana," by J. J. Joicey, F.E.S., and W. J. Kaye, F.E.S.

The latter was illustrated by a large collection of *Heliconius melpomene*, which was exhibited.

OBITUARY.

The late J. Platt-Barrett, F.E.S.

We regret to have to record the passing of another of the rapidly decreasing numbers of the older entomologists. J. Platt-Barrett died after a short illness at Forest Hill, on December 27th, 1916, and was buried by the side of his wife, at Birchington, on January 2nd, 1917. Physically and mentally alert, in spite of his 78 years, to within a day or two of his death, and keen on "renewals" to the last, as our Exchange column will show, he will be missed by many of the present generation of entomologists, but more so by that greater number, amongst whom his strength was spent, whose outlook in life was brightened by his careful and beneficent teaching. As a master of the Deaf and Dumb School at Margate, with which he was associated for upwards of fifty years, he was instrumental in converting into useful members of society, a great number of heavily handicapped children, who might otherwise have been a burden. Since his retirement from active work, in 1908, he had for some years given an evening's entertainment to the deaf and dumb of South London, to which he frequently invited the writer, who felt himself the only deaf person present. Those who were at the annual meeting of the Entomological Society last year will remember the "tale of a tramp," told by the President, that Mr. Platt-Barrett told *on his fingers* to his deaf and dumb guests shortly afterwards, who laughed as heartily as the Fellows who *heard* it.

His entomological career may be divided into two parts, as a young man and as an old. It was at his house at Peckham the South London Entomological and Natural History Society was founded. 1872 is the accepted date, but informal meetings were held there a year or two previously. He was elected President in 1877, but resigned membership just before his removal to Margate, and did not rejoin till 1900. He was elected a Fellow of the Entomological Society in 1911. A pleasant little story is told of his early days, which has the merit of being true. In 1872 a youth wished to join the South London Society, when someone objected to *boys*. Platt-Barrett said he would answer for him. That youth is now the youngest of its oldest members, and one of our most popular writers on natural history subjects.

Of late years Platt-Barrett made frequent visits to Sicily, and was present at the terrible earthquake at Messina, when he narrowly escaped the fate which befell his daughter-in-law and grandchild, and so many thousands of others. Both at the meetings of the Entomological and South London Societies he frequently exhibited his captures, and it is to his generosity that some of us owe the only Sicilian butterflies we possess. He was particularly interested in the genus *Melanargia*, and one of his last essays was a paper read before the South London Society on the European species of the genus, with special reference to the Sicilian forms. From time to time he contributed notes to the magazines, and when exhibiting usually enlivened his remarks with reminiscent details. Essentially a field naturalist, he preferred his own observations to anything second-hand. His collection, which he has bequeathed to the Horniman Museum, contains some good varieties, especially the much-figured form of *M. galathea*, somewhat like *M. lachesis*, which he took in North Kent, July, 1875. As a member of the Kent Archaeological Society he will be remembered as the writer (John Pharos) of the series of articles on the "Seven Churches of Thanet," and the "Annals of Birchington," the outcome of years of patient research and deciphering of ancient parish registers.—H.M.

Field Notes From Salonika. III.

By Captain M. Burr, D.Sc., F.E.S.

(*Continued from Vol. XXVIII., page 255.*)

August was not a favourable month for collecting, although the season was at its height, but the weather was stormy and windy most of the time, and certain other activities claimed time and energy till collecting days were over.

Early in the month, sweeping in some scanty herbage left by the side of a nearly dry brook produced *Mogoplistus brunneus* and *Tridactylus variegatus*: on the 10th, a female *Liogryllus bimaculatus* was brought me as a curiosity; a few minutes sweeping in the same scanty herbage some days later produced four species of Mantids, *Mantis religiosa*, *Iris oratoria*, *Parameles* sp., and *Empusa* sp., the latter two immature. The same evening the *Saga* laid four more eggs; towards the end of the month, on returning from a long trek, I found her dead in her cage; she had passed away from starvation, neglect, and oviposition combined, and perhaps a little old age: I am sorry to say that I even neglected her carcase afterwards, and now, instead of a handsome museum specimen, I have but a distorted and discoloured relic of this striking creature. From the sharply raised edges of the elytra of the male, I believe this to be *Saga vittata*, F. de W. About the same time, I heard from Dr. Forelli, from Turin, that the specimens which I had sent him, provisionally referred to as *Gampsocleis* sp., and *Glyphanus* sp., has been identified by Professor E. Giglio-Tos as *G. abbreviatus*, Br., and *G. heldreichi*, Br., respectively, both described in Brunner's "Prodromus," and noted only from Macedonia. Neither have been recorded since, so far as I can recall. The *Gampsocleis* has been referred to earlier in these notes: it is extremely abundant all over the neighbourhood, and I found it in several other localities in different parts of Macedonia, on occasions of various journeys.

Late in August I found *Gampsocleis abbreviatus*, and two undetermined species of Decticids in the Galeko valley, and was interested to find another *Dinarchus dasypus* there as late as August 20th. A day or two later I heard his stridulation at a considerable altitude in the mountain country at the back of Salonika, shewing that it is not, as I had at first suspected, confined to the plains.

In September I was able to do little collecting; in the Galeko valley I found some Decticids, referable, I think, to *Anterastes*, *Ameles decolor*, Charp., adult, and a *Parameles* with pointed eyes; *Acrida nasuta* L., abundant now everywhere, and also *Caloptenus italicus*; a single *Hololampra marginata*, Schreb., and one male *Euprepocnemis plorans*, Charp.

In October, between 5th and 10th, strolling over the plain near Aivatli, I noted *Mogoplistus brunneus*, *Platycleis intermedia* (?), *Mantis religiosa*, *Empusa* sp. (nymph), *Omocestus petraeus*, *O. haemorrhoidalis*, Charp., *Epacromia strepens*, Fabr. (common), *Acrida nasuta*, L., and *Platyphyma giornae*, Rossi, abundant, *Oedipoda caerulescens*, L., very common. Earwigs now began to appear, but only *Forficula auricularia*; (macrolabrous males quite common.)

At the end of October I picked up *Labidura riparia*, L., in the docks at Salonika. A few days later found me on the coast to the east of

Salonika, on the shores of a richly wooded and well sheltered bay; this spot must have been a grand collecting ground during the season; although it was so late, a few Orthoptera were lingering out. On November 6th, when going to the beach for a swim, I picked up *Acrotylus longipes*, Charp., an addition to our list, and found *Caloptenus italicus*, *Oedipoda caerulescens*, *Platyphyma giornae*, *Acrotylus patruelis*, extremely numerous, a few *Acridium aegyptium*, a single female *Platycleis* (*? vittata*), *Omocestus rufipes*, *Stauroderus bicolor*, and a red-winged *Oedipoda* that seems rather too pale for *O. miniata*. On November 10th, I found a *Mogoplistus brunneus* strolling up the walls of my tent, and a few chilled *Mantis religiosa* were found clinging, half-dazed to twigs, as late as December 3rd.

Probably all the later species occur throughout the winter. *Acridium aegyptium* appears adult in the early spring, but in the summer only immature specimens are to be found; *Epacromia thalassina*, and especially *E. strepens*, seem to occur all the year round, but adults are commonest in the autumn and at the beginning of spring, while stragglers are tempted out by the sun sometimes in January. The three European species of *Acrotylus*, at all events the two red-winged ones, *A. patruelis*, Sturm., and *A. insubricus*, Scop., certainly hibernate along the shores of the Mediterranean.

SUMMARY OF SPECIES OBSERVED.

DERMAPTERA.

Labia minor, L. Abundant in June, flying to light.

Forficula auricularia, L. A female near Kirechkeui in May; next one seen at Deve Kran in the first week in October, when this common earwig began to be pretty plentiful; the males are mostly macrolabrous.

Labidura riparia, Pall. One in Salonika Docks.

It was a disappointment that no other species were observed.

BLATTODEA.

Hololampra marginata, Schreb. Common in May and June on tall thistles.

Phyllodromia germanica, L. Common in restaurants in Salonika.

Periplaneta americana, L. Common in Turkish baths in Salonika.

Polyphaga aegyptiaca, L. I picked up one male in the gardens of the White Tower in Salonika.

MANTODEA

Parameles, sp. A small Mantid with pointed eyes is fairly common in suitable localities: I took larvae and nymphs near Lembet on August 1st, and on the 10th, and early in September near Ambarkeui, adult.

Ameles, sp. An adult, possibly *A. decolor*, Charp., near Ambarkeui early in September.

Mantis religiosa, L. Fairly common, adult specimens first appearing in August.

Iris oratoria, L. One near Lembet on August 10th.

Empusa, sp. I found no adult specimens; a very minute larva at Lembet in the beginning of April, and an occasional larva in

August; one well-grown larva at Deve Kran early in October.

ACRIDIODEA.

Acrida nasuta, L. First adult specimen noted on July 27th, after which it became abundant everywhere.

Ochrilidia tibialis, Fisch. Occurs sparingly in a few localities near Lembet.

Omocestus haemorrhoidalis, Charp. A few from Lembet.

O. viridulus, L. A few on the hills.

O. raymondi, Yersin. (?). One specimen I refer doubtfully here.

O. rufipes, Zett. Common.

Stauroderus bicolor, Charp. Common.

Stauroderus vagans, Fieb. Doubtfully identified.

Chorthippus pulvinatus, Fisch. de W. Common in low-lying and moist localities.

Ch. dorsatus, Zett. Doubtfully identified.

Stauronotus maroccanus, Thunb. Some near Lembet.

S. brevicollis, Eversm. Common on the dry hills round Lembet.

Arcyptera flavicosta, Fischer. A pair near Daudbali on June 18th.

Epacromia strepens, Latr. Common.

E. thalassina, Fabr. Common. Specimens of *Epacromia* may be found almost all the year round.

Oedaleus nigrofasciatus, De Geer. Common from June.

Pachytylus danicus, L. A few seen in June and July.

Celes variabilis, Pall. Common in certain spots in May and June.

Oedipoda caerulescens, L. Not common.

Oedipoda miniata, Pall. One or two near Lembet.

O. gratiosa, Serv. A few observed.

Acrotylus insubricus, Scop. Lembet.

A. longipes, Charp. One in November.

A. patruelis, Sturm. Common; flies to light.

Glyphanus heldreichi, Br. Not uncommon on the Lembet plain in May and June; larvæ in the "Happy Valley" on May 5th; a lingerer on the Balza road on July 30th.

Platyphyma giornae, Rossi. A female early in April; common from July.

Acridium aegyptium, L. Hibernated specimens about in April; new generation not very numerous.

Caloptenus italicus, L. Ubiquitous as usual in these latitudes from the middle of the summer into the autumn.

Euprepocnemis plorans, Charp. A male early in September in the rank vegetation along the Galiko Valley north of Yeni Mahalah.

Tettix bipunctatus, L. (?). Lembet in June.

LOCUSTODEA.

Poecilimon sp. A nymph at Kirechkeui at end of May.

Isophya sp. One male.

Acrometopa macropoda, Burm. One male in June, from near Akbunar.

Tylopsis liliifolia, Fieb. Common from middle of June, both mottled and green forms.

Xiphidium fuscum, Latr. A few nymphs occasionally by sweeping.

Locusta viridissima, L. One male.

Dinarchus dasypus, Illig. Common in colonies near Daudbali and Lembet; reported from Kirechkeui and Stavros; heard and seen in Galiko Valley near Yeni Mahalah as late as August 20th; one male at a considerable altitude above Akbunar about same date.

Gampsocleis abbreviatus, Br. Abundant on the Lembet plain and on the Langaza plain.

gen.? and sp., ? Two other Decticids, of which I cannot even suggest the genera, must await a more favourable opportunity for determining them.

Platycleis grisea, Fabr. Abundant.

Platycleis affinis, Fieb. (?). Abundant.

Platycleis sp. A third species of the same group also occurs.

Platycleis vittata, Charp. Very common.

Decticus albifrons, Fabr. Abundant; rather a small race.

D. verrucivorus, L. Several specimens from the high ground.

Saga vittata, F. de W. I think this is the species which occurs here fairly commonly.

GRYLLODEA.

Oecanthus pellucens, Scop. Common.

Liogryllus bimaculatus, De G. Common.

Gryllus burdigalensis, Latr. (?). Very common; flies to light.

Mogoplistus brunneus, Serv. Common on grass, etc., in late summer.

Gryllotalpa gryllotalpa, L. Very common. Flies to light and found in dug-outs.

Tridactylus variegatus, Latr. On banks of brooks.

Dermaptera	4	species.
Blattodea	4	,,
Mantodea	5	,,
Acridiodea..................	30	,,
Locustodea	17	,,
Gryllodea	6	,,
Total	66	species.

Myrmecophilous Notes for 1916.

By H. DONISTHORPE, F.Z.S., F.E.S.

(*Continued from page 33.*)

Acanthomyops (*Chthonolasius*) *flavus* F. On June 17th, at Bewdley, a very populous and prosperous colony of this ant was found under a large heavy stone, standing upright against a bank by the side of a road. The nest, which was very large, contained countless ☿ ☿, sex and ☿ pupæ, many packets of eggs, and no less than nine queens! This is very remarkable, as usually only one queen is present in a colony of this species. These queens, with a number of ☿ ☿, brood, etc., are now on board H.M.S. Benbow, and are, I am informed, progressing favourably.

Acanthomyops (*Chthonolasius*) *umbratus* Nyl. A marriage flight of this species had evidently taken place at Crowthorne, on July 30th, as my friend, Mr. W. E. Sharp, and I observed a number of deälated ♀ ♀ running about in a sand-pit in the afternoon, near nests of *Acanthomyops* (*Donisthorpea*) *niger*. One ♀ had a dead *niger* in her jaws, another lay dead near the entrance to a *niger* nest. Although the founding of colonies by *umbratus* ♀ ♀ in nests of *niger* and *alienus* has been proved beyond question, it is always as well to record all observations in the field bearing on the subject.

On May 17th ☿ ☿ of *umbratus* were taken from a colony at Deal, nesting under a sod on the sandhills, and on August 23rd others were captured in a decaying birch tree in Richmond Park. Both lots were introduced into my *umbratus* observation nest and were well received none being attacked or killed ; a fact which I have demonstrated before on various occasions with this species.

Acanthomyops (*Donisthorpea*) *niger* L., var. *alieno-niger* Forel. Forel in his last work on the ants of Switzerland [*Mitt. Schweiz. Ent. Gesell.*, **12**, 56 (1915)] says that the ♂ of this variety is unknown. In my book, *British Ants*, p. 211, I record ♂ ♂ from Weybridge and Clacton-on-Sea. These specimens are intermediate between ♂ ♂ of *niger* and *alienus* in size, colour, and pubescence.

Formica rufa L., var. *rufo-pratensis* Forel. Forel (*l.c.*, p. 61) also says the ♂ of this variety is unknown. I record a specimen from the Isle of Wight (*l.c.*, p. 265), and state that the wings appear to be a little blacker than in *rufa*, probably only an individual variety. It is somewhat intermediate between *rufa* and *pratensis*, being much nearer to *rufa* [=*rufa-pratensoides* Forel, *Denkschr. Schweiz. Ges. Naturw.*, **26**, 16 (1874)] than to *pratensis*, as might be expected in Isle of Wight specimens.

Formica rufa L., var. *alpina* Sants. Forel again (*l.c.*, p. 60) states that, the ♀ this time, of this var. is unknown. I have published (*l.c.*, p. 266) a careful description of this sex from eight deälated specimens taken in Scotland.

It should be mentioned that our eminent and accomplished Swiss colleague's work was in the press at the same time as my own book, and consequently it was impossible for him to know what I had published.

Formica sanguinea Latr. On May 10th I visited the spot near Woking where the two colonies in which Pseudogynes were found in 1913, 1914, and 1915, are situated [see *Brit. Ants*, p. 296; *Ent. Rec.*, **28**, 8 (1916)] ; the only colonies in which I have ever found pseudogynes in this district. They had evidently joined forces, one large nest only, in a flourishing condition, being present. It was found to contain a large number of pseudogynes, great numbers of ordinary ☿ ☿, egg-masses, and over a dozen *Lomechusa strumosa*. A queen, a number of ☿ ☿, pseudogynes, packets of eggs, and six *Lomechusa* were taken home and fixed up in a four-chamber "Janet" nest. The mite, *Laelaps oophilus*, was present among the egg-masses.

The queen laid eggs on May 13th, June 3rd, etc. On June 20th I introduced a number of *sanguinea* sex pupæ, and packets of eggs from

Bewdley, which were all taken in by the ☿ ☿ and pseudogynes. This appears to have annoyed the ants, as although they were supplied with plenty of animal food and honey, by July 1st they had devoured all the sex pupæ, eggs, and their own brood, and had killed all the *Lomechusa*, some of which had been cut up. On July 8th I introduced ☿ cocoons of *F. fusca* and *F. rufibarbis* from Weybridge, to act as slaves; most of these were allowed to hatch, and live in the nest, but the female has not laid since. The colony is in good condition to-day, very few deaths have occurred, but of course no brood has been reared. The pseudogynes behave in the same manner as ordinary ☿ ☿, helping to kill and cut up prey, etc., etc.

On July 29th, near Wellington College, a deälated *sanguinea* ♀ was observed running on the ground near the nest of a *fusca* colony. The spot was far removed from any *sanguinea* colony known to me, and Sharp, who was with me at the time, told me that he did not know of any *sanguinea* nest within a mile of where we were. This was a good instance of the case when a *sanguinea* ♀ after the marriage flight finds herself far removed from a colony of her own species, and sets about to find a *fusca* nest in which to found a colony.

Formica fusca L., var. *rubescens* Forel. On June 27th, I visited the original colony of this variety which I discovered at Bewdley in 1908 (*Brit. Ants*, p. 319). It was still situated under the same large very heavy stone on the embankment, and was very populous. It is a curious fact that, as on previous visits, after the most careful search, no queen could be found. ♂ pupæ were plentiful, but neither ♀ nor ☿ pupæ were present. It seems impossible that a queenless colony could exist, and flourish, for eight years if only ♂ ants were produced. It is probable, from our present knowledge, that ☿ ☿ have been continually reared from eggs laid by the ☿ ☿; ♂ ♂ from the same source being brought up in their proper season. These ♂ ♂ would fly away and fertilize ♀ ♀ from other colonies which would occur in the same district. I may mention I found other ☿ ☿ at some distance away, running about on the paths. The time at my disposal did not allow me to hunt for their nests.

The only myrmecophiles present in the old nest were *Beckia albina* and *Platyarthrus hoffmanseggi*.

COLEOPTERA.

Lomechusa strumosa F. The following few notes were made on the specimens referred to above under *Formica sanguinea*. June 1st, a pair of *Lomechusa in cop.*, and again in the evening: June 2nd, 2.30 p.m., another pair *in cop.*: June 3rd, ditto; June 4th, a pair *in cop.*, the ♀ feeding on a recently killed bluebottle: June 7th, a pair *in cop.*; June 11th, ditto; June 13th, ditto, and a ♂ was observed endeavouring to copulate with a dead fly! Two other specimens eating at a dead earwig and dead fly. As before recorded after June 20th the *Lomechusa* were all killed by the ants. I was very disappointed at the untimely end of these beetles, as I was most anxious to obtain their very young larvæ.

Wasmann has demonstrated in two very valuable papers [*Zeits. wiss. Zool.*, **114**, 233-402 (1915): *Wien. Ent. Zeit.*, **34**, 382-93 (1915)] that this beetle is viviparous, tiny live larvæ being deposited by the parent beetle on to the brood of the host. Eggs that were formerly supposed to be those of the beetle were really only those of the ants, and naturally when very young *Lomechusa* larvæ were observed, they were thought to have hatched from these supposed eggs. It is not astonishing that such mistakes should have arisen; in 1909 I recorded, "On May 10th, I noticed a *Lomechusa* in a small nest of *F. sanguinea*, from Woking, laying eggs on the ant's eggs in the nest." [*Ent. Rec.*, **21**, 287 (1909)]. Eggs were not actually seen laid (Wasmann has recorded similar observations), but no doubt the beetle was on the point of producing offspring, and I missed the important part, or did not wait long enough to complete the observation. Father Wasmann is much to be congratulated on his most interesting discovery.

Amphotis marginata F. The insect referred to in my last notes [*Ent. Rec.*, **28**, 34-5 (1916)] was fed by the new *umbratus* ☿ ☿ and remained quite at home in the nest. On May 11th, I introduced a smaller specimen (from Woking) for company, but they never paid any attention to each other, probably being the same sex. There is not any external difference that I can see in the ♂ and ♀ of this beetle. I have dissected a number of specimens, and the ♂ ♂ and ♀ ♀ are both of all sizes. On July 1st, the old beetle was killed and cut up by some ☿ ☿ ; this was probably the work of the Deal ants introduced in May and June, or fresh ☿ ☿ from Woking introduced, late in June. This beetle had lived for nearly two years in the nest, having been introduced on August 25th, 1914. Having secured such a very large number of *Amphotis* at Woking (referred to above under *fuliginosus*) I had hoped to obtain the larvæ, and also breed the beetle from the egg; but in this I was disappointed.

A number of pieces of wood from the gate post, tunnelled and hollowed out, were placed in the *fuliginosus* observation nest, and in these most of the beetles usually rested. Over 100 *Amphotis* in all, of all sizes varying from 3·8mm.-6·2mm. in length, were introduced. (Fowler gives the length of this beetle as, 4·5mm., and Ganglbauer, 4-4·5mm). They were frequently fed by the ants (the latter consuming large quantities of honey), also feeding on flies and other prey given to their hosts. When a bluebottle was introduced and had been killed by the ants, the *Amphotis* would emerge from their hiding places and swarm all over it, pushing the ants aside, and completely enclosing it in a struggling mass of beetles. Unfortunately during my absence for a few days in August the nest was left uncovered, the ♀ and ☿ ☿ escaped, probably through the open window, and also very many of the beetles. Although this nest had been under constant observation since May, no copulation between the beetles was ever noticed, no eggs appeared to be laid and no larvæ were seen. I had continually taken out the bits of wood, and carefully examined them, as also the whole of the nest. As there were now only some 30 beetles left, and no ants, I removed them and placed them in a single chamber plaster nest, without any wood. They were fed with flies, honey, etc., but gradually died off from day to day. The last two alive I introduced into the *umbratus* nest, where they are alive and well to-day.

The British Collection of Ants in the National Collection.

In 1916 I thoroughly overhauled and rearranged all the British

Ants in the Museum at South Kensington, incorporating with them the late Edward Saunders' collection.

I discovered a ♂ of *Ponera punctatissima* from Oxford, doing duty as a ☿ in the General Collection of ants; this I transferred to the British Collection (this is only the second known British specimen, the other was taken by Mr. Britten in Cumberland, and is now in my own collection), and I have also added over 600 specimens of my own captures.

I have arranged and classified the ants according to our present knowledge on the subject, the collection now being a nearly complete and very fine one. It should prove of great use to all British students who wish to study our ants, or name their captures.

The Water-Beetles of Wood Walton Fen.

By H. DONISTHORPE, F.Z.S., F.E.S.

Through the kindness of the Hon. N. Charles Rothschild I was able to pay three visits (once in July and twice in August) last year to his fen in Huntingdonshire, for the purposes of collecting Coleoptera, etc. On the last occasion I was joined by my friend Mr. Willoughby Ellis. A considerable part of the time was spent in fishing for water-beetles, when most of the lodes and dykes were explored. The following is a complete list of all the *Hydradephaga* and *Hydrophilidae* which were captured. I append a few notes to the rarer and more interesting species.

HYDRADEPHAGA.

Haliplus confinis Steph., common.
,, *flavicollis* Strm., scarce.
,, *variegatus* Strm., common.
,, *ruficollis* DeG., common.
,, *wehnckei* Gerh., scarce.
,, *immaculatus* Gerh., scarce.

I have to thank my friend, Mr. W. E. Sharp, for kind assistance in identifying the *ruficollis* group. Most of these species appear to be confined to particular dykes. Large numbers of *Halipli* were taken, and the scarcity or otherwise of these captures is of course only based on the results.

Laccophilus obscurus Pz., common.
Hyphydrus ovatus L., common.
Coelambus versicolor Schall., common
,, *inaequalis* F., common.
,, *decoratus* Gyll., common, but local. This is a local species in Britain.
Coelambus confluens F., common.
Deronectes assimilis Pk., common.
,, *depressus* F., common.
,, 12-*pustulatus* F., common.
Hydroporus pictus F., common.
,, *granularis* L., common. A rather local species.
,, *lepidus* Ol., common.
,, *halensis* F., common in one ditch. This is a very local Fen species.

Hydroporus dorsalis F., common.
„ *lineatus* F., common.
„ *gyllenhali* Schiödt., common.
„ *vittula* Er., scarce.
„ *palustris* L., common.
„ *erythrocephalus* L., common.
„ *pubescens* Gyll., common.
„ *planus* F., common.
„ *lituratus* F., common.

Agabus abbreviatus F., not uncommon in one ditch only. This is a very interesting capture, as it was formerly abundant in the Fen districts, and is evidently a survival. It is *the* Askham Bog species, where it is usually abundant (Beare and I found it in plenty when there together a few years ago), but I am not aware that it has been found anywhere else in Britain for many years with the exception of Cambridgeshire, where it is recorded from Chatteris and Holwoods by Fryer; and two specimens were taken by Dollman, at Soham, October 24th, 1912.

Agabus sturmi Gyll., common.
„ *bipustulatus* L., common.
Platambus maculatus L., common.
Ilybius fenestratus F., common.
„ *ater* DeG., common.
„ *obscurus* Marsh., common.
Copelatus agilis F., common.
Rhantus grapii Gyll., scarce.
„ *exoletus* Forst., abundant. Many specimens are very dark beneath.

Rhantus adspersus F.? I captured a specimen of a *Rhantus* like *exoletus*, and was struck by the black markings beneath, but unfortunately I let it drop and lost it. Having broken my net I was unable to hunt further. This specimen may have been *R. adspersus*, the locality being very suitable, but on the other hand much fishing on subsequent occasions failed to produce more, and as I have already pointed out, many specimens of *R. exoletus* which were taken were dark beneath.

Colymbetes fuscus L., common.

Dytiscus marginalis L., not very common. It was curious that this was the only species of the genus that occurred. At Wicken four species may often be found together.

Hydaticus transversalis Berg., very scarce. This is a local and not common species.

Hydaticus seminiger DeG., not rare. Also a local species.
Gyrinus elongatus Aubé., scarce. A local species.
„ *marinus* Gyll., abundant.

HYDROPHILIDÆ.

Limnebius truncatellus Th., common.
„ *picinus* Marsh., common. This is a very local species.

Hydrochus carinatus Germ., scarce. This very local species has only been found in very few localities in Britain.

Ochthebius pygmaeus F., common.
Hydraena testacea Curt., scarce.
„ *riparia* Klug., abundant.

The Coloration Problem. II.

By W. PARKINSON CURTIS, F.E.S.

(*Continued from page 38.*)

11. **Parus caeruleus** race **obscurus**, Prazate. British Blue Titmouse.

Observer.—W. P. Curtis. Time.—Afternoon.
Date.—June 7th, 1913. Sex.—♂ and ♀.
Place.—Canford, Dorset. Duration.—3 hours.

Food.—Number of visits counted was 180. This was for both parents coming to a nesting box fixed in a wood. Food brought was green larvæ on every occasion but three times, when two Lepidopterous imagines and one Dipteron were brought. To this must be added that three brown larvæ altogether were brought with the green ones, which I concluded were two *Hypsipetes sordidata* (*elutata*) and one *Hibernia defoliaria*. At this time I had not realised the value of an exactly timed and detailed record and contented myself with counting and entering the count in my pocket field notebook.

Note.—Total, 180 recorded. Food brought and identified every time. Insect food every time. Lepidopterous imago once.

12. **Ægithalus caudatus** race **roseus**, Blyth. British Longtailed Titmouse.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—May 24th, 1914. Sex.—As below.
Place.—Canford, Dorset. Duration.—1 hour.

Time.—12.30. Sex.—♀.
Food.—Unidentified.

Time.—12.50. Sex.—♂.
Food.—Unidentified.

Time.—1.10. Sex.—♂ and ♀.
Food.—Unidentified.

Time.—1.20. Sex.—♀.
Food.—Green larva.

Time.—1.25. Sex.—♂.
Food.—Either a wingless ♀ of a moth or a moth with wings detached, handed by ♂ to ♀ on nest. (This is E.H.C.'s note, but I think the latter is the only satisfactory explanation, having regard to date and locality.)

Time.—1.25. Sex.—♀.
Food.—Unidentified.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—May 24th, 1914. Sex.—As below.
Place.—Canford, Dorset. Duration.—1 hour.
Food.—Unidentified.

Time.—2.33. Sex.—♂.
Food.—Unidentified.

Time.—2.35. Sex.—♂.
Food.—Unidentified.

TIME.—3.15. SEX.—♀.
FOOD.—Unidentified.

TIME.—3.23. SEX.—♂.
FOOD.—Unidentified.

TIME.—3.25. SEX.—♂.
FOOD.—Two or three brownish-white larvæ.

TIME.—3.55. SEX.—♀.
FOOD.—Unidentified.

OBSERVER.—E. H. Curtis and W. P. Curtis. TIME.—?
DATE.—April 9th, 1916. SEX.—?
PLACE.—Canford, Dorset. DURATION.—Casual.

FOOD.—Bird disturbed a Geometer from the trunk of a sallow, followed it into the air and captured it. (Probably *Lobophora lobulata* or possibly *Hibernia leucophaearia* or *Malenydris multistrigaria*. This is guess work based on what was about, we do not profess to have been able to identify the insect.)

NOTE.—Total, 14 records. Food identified four times. Insect food every time. Lepidopterous imagines twice.

13. **Melizophilus undatus** race **dartfordiensis**, Latham. The Dartford Warbler.

OBSERVER.—E. H. Curtis. TIME.—12.40.
DATE.—July, 1916. SEX.—♂ and ♀.
PLACE.—Canford, Dorset. DURATION.—No record.

FOOD.—*Eupithecia nanata*, *Crambus sylvellus*, *Crambus pascuellus*. Some taken at rest and some flying. Very unfortunately E.H.C. has kept absolutely no details of this, and I was not present, but went up with him after to identify the insects on the ground, when he picked out the above three as having been those captured by the birds.

14. **Phylloscopus trochilus**, L. The Willow Warbler.

OBSERVER.—E. H. Curtis. TIME.—12.40.
DATE.—June 29th, 1913. SEX.—?
PLACE.—Bere Wood, Dorset. DURATION.—No record.

FOOD.—Searching on an ash tree found a green larva and gave it to a young one as big as itself, then caught a few minute flies, which it swallowed.

OBSERVER.—E. H. Curtis. TIME.—?
DATE.—August 3rd, 1913. SEX.—?
PLACE.—Arish Mell, Dorset. DURATION.—Casual.

FOOD.—One dived into a tangle of undergrowth after *Pieris rapae*, but could not be followed to see what happened.

OBSERVER.—E. H. Curtis. TIME.—Afternoon.
DATE.—May 16th, 1914. SEX.—♂ and ♀.
PLACE.—Canford, Dorset. DURATION.—2 hours.

FOOD.—Observations at nest. No detailed record kept. The only food identified was a larva of *Tortrix viridana*.

OBSERVER.—E. H. Curtis TIME.—As given.

Date.—May 17th, 1914. Sex.—As below.
Place.—Canford, Dorset. Duration.—1 hour.

Time.—11.40. Sex.—♀.
Food.—*Tortrix* larva (*Tortrix viridana* on balance of evidence).

Time.—11.45. Sex.—♂.
Food.—Unidentified.

Time.—11.50. Sex.—♂.
Food.—Larva of *Scopula prunalis*.

Time.—12.0. Sex.—♀.
Food.—White Tortrix larva.

Time.—12.15. Sex.—♂.
Food.—Unidentified.

Time.—12.20. Sex.—♀.
Food.—Unidentified.

Time.—12.25. Sex.—♀.
Food.—White Tortrix larva.

Time.—12.27. Sex.—♂.
Food.—Larva.

Time.—12.30. Sex.—♀.
Food.—Unidentified.

Time.—12.40. Sex.—♀.
Food.—Yellowish-green Tortrix larva.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—May 17th, 1914. Sex.—♂ and ♀.
Place.—Canford, Dorset. Duration.—2 hours.

Time.—1.43. Sex.—♂ and ♀.
Food.—Unidentified.

Time.—2.18. Sex.—♀.
Food.—Tortrix larva.

Time.—2.20. Sex.—♂.
Food.—Tortrix larva.

Time.—2.30. Sex.—♀.
Food.—Tortrix larva.

Time.—2.38. Sex.—♀.
Food.—Unidentified.

Time.—2.45. Sex.—♂.
Food.—Unidentified.

Time.—2.46. Sex.—♀.
Food.—Unidentified.

Time.—3.5. Sex.—♂ and ♀.
Food.—Unidentified.

Observer.—W. P. Curtis. Time.—Afternoon.
Date.—April 9th, 1916. Sex.—?
Place.—Canford, Dorset. Duration.—Casual.

Food.—A very sporting attempt to catch *Brephos parthenias*, whic
was feeding at sallow. The insect dodged and the pursuit was hot ti

B. parthenias danced off. *P. trochilus* is, to use a nautical expression, "quick on her helm," but I know few flights quite as dazzling as that of *B. parthenias*, and it is a very wary insect, especially if the sun is hot, which it was that day, so its escape was not unexpected. I was, however, surprised to see *P. trochilus* try such a robust insect.

Observer.—W. P. Curtis and L. M. Cook.
Time.—4 p.m.
Date.—August 6th, 1916.
Sex.—♂.
Place.—Arish Mell, Dorset.
Duration.—20 minutes.

Food.—Watched *P. trochilus* ♂ catching Micros in an ash tree. He hovered before the foliage, looking up under the leaves and twigs, and dabbed in suddenly three times and each time caught a Micro and swallowed it. The insects were at rest, but I am unable to hazard a guess as to species. He also spent a long time searching. We were about five feet from the bird.

Note.—These observations are difficult to tabulate owing to absence of details on May 16th, 1914, but as the detailed records produced 10 visits in 2 hours, I will assume 10 as the number. This gives 38 records. Food identified 18 times. Five times the attacks were on Lepidopterous imagines. Three only were completed.

15. **Phylloscopus sibilatrix,** Bechst. The Wood Wren.

Observer.—E. H. Curtis and W. P. Curtis.
Time.—Afternoon.
Date.—June 1st, 1913.
Sex.—?
Place.—Canford, Dorset.
Duration.—No record. About ½ an hour.
Food.—Green larvæ. No details.

Observer.—E. H. Curtis and W. P. Curtis.
Time.—Afternoon.
Date.—June 3rd, 1916.
Sex.—?
Place.—Canford, Dorset.
Duration.—No record. About ½ an hour.
Food.—Green larvæ. No details.

(*To be continued.*)

SCIENTIFIC NOTES AND OBSERVATIONS.

Record and record.—Among the many ideas which invaded the active mind of the late J. W. Tutt, at the inception of this magazine, was that of providing a means of recording facts relating to Entomology, however slender they might be, so that from the accumulation of small facts a permanent advance in knowledge might be gained, in the same way, to use an example familiar to entomologists, that a useful structure arises from innumerable small threads when a caterpillar spins its cocoon. At this time of year, when field work is only for the very enthusiastic, the more seasoned or the more lazy entomologist may look up his note books and probably cull from them some small items, waifs and strays, that have not yet found an appropriate niche. These small items, often gathered by chance, if not brought to light when opportunity comes, may lie buried for years, like much of the field knowledge of our predecessors, and also, one is sorry to say, like many facts known to living entomologists, who from shyness or other causes go on amassing collections but never record anything except, perhaps, the capture of some rare species. Of course these small items when compared with the monograph of a genus, or with a well written account of an entomological holiday, are unimportant and perhaps of little general interest. Yet, on the other hand, an item may be just the link in the chain required by some one working at a particular group, or at some special problem, if not to-day perhaps later. Then again, some other observer reading the note may confirm or dispute it, and so we get at the truth; or nearer to it. In Staintonian days several species new to Britain were discovered here from items of information as to their habits obtained from continental sources. Though by the way, we have not yet found the larva of *Miselia bimaculosa* in the chinks of the bark of elms. The beginner in entomology often makes a useful observation, but either thinking it not worth writing about, or not knowing where to record it, lets it slide into oblivion, while the *Entomologist's Record* and its many readers would gladly give it a welcome. In these dismal times some little change of thought is quite necessary, and when the brighter days dawn we shall return to our favourite pursuit with greater zest. The net will then be be wielded more actively and the sugar laid on more thickly than ever. We shall then be eager for new work, and the time for looking up our past doings will have gone by. It seems then now opportune to give ourselves a slight relaxation by looking over our entomological diaries, gathering up the various items and giving them a permanent place where they will be of greater use.—A. SICH. *February*, 1917.

EGG-LAYING OF RUMICIA (CHRYSOPHANUS) PHLÆAS.—Between 11 a.m. and 12 a.m., on September 10th, 1911, I watched a specimen of *Rumicia* (*Chrysophanus*) *phlaeas* ovipositing in a field in Chiswick. She allowed me to get within a few inches of her, and I could see the ovipositor protruded while she was searching the leaf for a suitable place to lay. During oviposition she held her wings quite closed. She only appeared to lay one egg on each patch of sorrel that took her fancy, as after having laid her egg she flew off, and I could not find more than one ovum on any of the four patches I saw her make use of. She seemed quite content if the plant had only a few small leaves on it. She tried to place each egg under the edge of the leaf, but if this was to her too inconvenient she placed it on the upper surface. After each laying she took a short flight and sometimes sunned herself on a leaf of yarrow, or flew on to a flower of hawkweed and took a meal. Then she would again visit the sorrel. I only saw her make use of *Rumex acetosa*, though *R. acetosella* was equally common. When first laid the egg is pale grey to the unaided eye, but under the microscope it is pale green in the hollows, while the ridges are white. The larvæ hatched on September 20th.—ALFRED SICH, Chiswick.

A NEW USE FOR PILLAR BOXES.—Passing a postal pillar box, on Chiswick Mall, last November, I saw what appeared to be chaff caught in a spider's web. But on a nearer view the chaff was found to consist of numerous cocoons of *Cemiostoma laburnella*, Stt. Round the top of the pillar are a number of deep slots, and each one had its quota of cocoons. In one I counted eight. There must have been hundreds on the pillar. A neighbouring laburnum partly overhung the pillar box.—ALFRED SICH. *February*, 1917.

Cosymbia (Zonosoma) pendularia ab. subroseata.—I have recently been looking up the various named forms of the above species and find that Mr. Prout pointed out in May, 1913 (Seitz' *Palaearctic Lepidoptera*, Geometers, p. 148), that the prior name of this form was *decoraria*, Newman. He says, "Woodforde, in naming the form, overlooked *decoraria*, Newman. This name was founded on a single specimen, without indication of locality, bred from a larva which was said (no doubt erroneously) to have been found feeding on the bedeguar or mossy gall of a rose in a garden." This specimen was exhibited at the meeting of the Entomological Society of London, on October 7th, 1861, and "passed into the hands of Bond, and was figured (uncoloured and without mention of the name) in the *Entomologist*, vol. ix., p. 217, and more recently in Barrett's *Lep. Brit. Isles*, vol. vii., pl. 382. The type is now in the Sydney Webb collection, and has been carefully examined by Mr. Prout. Hence the name should stand as ab. *decoraria* (*subroseata*).—H.J.T.

NOTES ON COLLECTING, Etc.

An apology to Mr. Sheldon.—In the December number, 1915, of this periodical, Mr. Sheldon challenged certain of my Spanish captures, or, to be exact, challenges my knowledge of them. I have not been in a position to send him a return cartel because, though Mr. Sheldon's challenge was openly sent it was never delivered. It may surprise Mr. Sheldon and others to hear that the powers that be do not allow the *Record* to enter into a neutral or hostile country. The information it gives on the British localities in which *V. cardui* and *C. boreata* are to be found might evidently be utilised by the Central Powers should the contemplated storming of these islands become an accomplished fact.

Even now that I have returned to the fog-clad plains I can only send Mr. Sheldon an apology instead of answering his challenge. I have necessarily left my Spanish and other ammunition in Switzerland, so §§ two and three (pages 279, 280, vol. xxvii.) concerning *Argynnis cydippe* (*adippe*) var. *cleodoxa* and *Agriades coridon* var. *albicans* must go unanswered. I can, however, make some sort of a reply re *Tarucus theophrastus*. At Pajares, when I netted these Lycaenids I took them to be a small form of *telicanus*, knowing full well that the African *theophrastus* had never been noted so far north. On examining the butterflies at home a month later I concluded that they were not *telicanus*, and on careful re-examination found that they were undoubtedly *theophrastus*. The examination was made all the more carefully because Dr. Chapman at once suggested that they might be a small form of *telicanus*. I am afraid I can hardly expect Mr. Sheldon to be satisfied with this unsupported statement, but I am unable at present to produce slides of genitalia as incontrovertible witnesses, all slides having been left behind with other evidence. I can only promise Mr. Sheldon full satisfaction as soon as I shall have an opportunity of returning to Switzerland. I feel perfectly confident myself that the butterflies are *theophrastus*. How they had got so far north is quite another question. I should be inclined to think that it would be far more difficult for a blue to get across from Africa to the South of Spain than to continue her journey northward by stages, unless barred off by a mountain range.—P. A. H. Muschamp, Charterhouse, Godalming.

GLOUCESTERSHIRE LEPIDOPTERA.—Since my notes in a previous volume the following species which, so far as I am aware, are unrecorded for the county, have been taken or bred by myself, and, with the exception of the last, all in the neighbourhood of Stroud. *Paedisca occultana*, beaten from *Pinus*, July 24th, 1916; *Asthenia* (*Coccyx*) *pygmaeana*, resting on a beech trunk, but close to some fine old spruce fir, April 18th, 1918; *Coleophora virgaureae*, bred, August 12th, 1916, from larva on the seeds of the Golden Rod; *Laverna conturbatella*, flying among *Epilobium angustifolium*, July 3rd, 1916; and *Phylloporia bistrigella*, beaten from birch, June 2nd, 1918, in the Dean Forest district.—W. B. DAVIS, 8, Rosebank Villas, Churchfield Road, Stroud, Gloucestershire. *February 22nd*, 1917.

CURRENT NOTES AND SHORT NOTICES.

The following members were elected as Officers and Council of the Lancashire and Cheshire Entomological Society for the ensuing year, *viz.*:—*President*, L. West, M.I.M.E. *Vice-Presidents*, Dr. John Cotton, Wm. Webster. *Hon. Treasurer*, Dr. John Cotton. *Hon. Librarian*, F. N. Pierce, F.E.S. *Hon. Secretary*, Wm. Mansbridge, F.E.S. *Council*, Messrs. C. F. Burne, J. W. Griffen, A. W. Hughes, J. Collins, R. Wilding, P. F. Tinne, M.A., S. P. Doudney, E. A. Cockayne, M.A., M.D., F.E.S., W. A. Tyerman, Wm. Buckley, Prof. R. Newstead, M.Sc., F.R.S., and Gervase F. Mathew, F.L.S., F.E.S.

In the *Scottish Naturalist* for December is a short article, "Notes on the Insects captured in the Island of Raasay." The insects were taken in the summer of 1916, by Mrs. Gaskell, and submitted for identification. *Erebia aethiops* was said to be in great numbers. *Brenthis selene* and *Argynnis aglaia* both occurred. A female *Sympetrum striolatum* was the only Dragonfly captured. "Probably the most interesting insect in the whole collection" was that of the Dipteron, *Limnobia bifasciata*, of which there are only a few records in Scotland. Most of the species taken were found on the lawn or among bracken very near the sea. The identifications were made by Messrs. Evans and Grimshaw. "Some Forest Insects in Aberdeenshire," contains notes on the sawfly *Nematus erichsonii*, and the Coleoptera *Attelabus curculionides*, *Cryptorhynchus lapathi*, and *Crypalus abietis*, by W. Ritchie. There are also extended remarks on "Scolytids and other Coleoptera of the Forth Area," by W. Evans.

The *Bull. Soc. ent. France*, for November, contains an account of the damage done to the leaden lining of a chamber in a chemical factory by *Sirex gigas*. The larvæ, which take two or three years to feed up, were no doubt present in the timber which formed the framework and the damage was done by the imagines in their attempts to escape. Dr. Verity in the same month describes and names two forms of *Zygaena*. (1) A form of *Zygaena erythra* from Sicily of large size, bright coloration, whitish feet (pattes) in the males, and the females with much stronger silvery feet than in those of the continental form. It is called *albipes*. (2) A form of *Zygaena rubicunda* which is very comparable to the normal form of *Z. erythra*. It is called *erythraeformis*.

In an earlier Current Note, reference was made to the energy and enterprise of Russian men of science, in particular was noticed the expedition of Alexander Borisovich Shelkovnikov into the newly occupied districts of Persia to Urmi.

The party left Tiflis on April 20th, and returned on June 28th, (Old Style), after visiting Tavriz, Maragi, Urmi, Salmasta, and Khoia, and a few uninhabited islands in Lake Urmi. Great wealth of material was amassed. The zoologist, Smirnoff, unfortunately, broke his leg at the beginning of the journey, and was obliged to return to Tiflis, so that the mammalian fauna received perhaps less attention than it would otherwise have done. Very important geological collections and observations were made by V. V. Bogacheff, whose name is a guarantee of good work.

About 8000 specimens of insects were collected; the season was too early for Orthoptera, and Decticids and Locustids were very scarce, but some very interesting *Nocarodes* and *Callimenus* were taken, both genera of peculiar interest; a fair number of Acridians were taken, as they began to appear at the later part of the journey; the Orthoptera have been handed over to B. P. Uvaroff for determination.

In other branches of zoology a fine collection of reptiles was made, including an apparently new species of horned viper and a very large *Salamandra*; these were taken near the Turkish frontier, where the party crossed the pass through the mountain crest to the south-east of Urmi; this region, Shamsdinan, has, it is believed, hitherto been visited by one European only, Captain Jackson, former Military Consul at Van.

A fair collection of fish was made, from the lake and from rivers, including the upper waters of the Tigris. Among the bigger vertebrates not much was done. The most interesting things were material and observations on the Urmi Sheep, which lives on the island of Koiun Dagh, and on the flamingo, which makes its home on the islands in the lake.

Among invertebrates, other than insects, molluscs, worms, spiders, and centipedes were collected. Ten thousand botanical specimens were brought back, and a rich palæontological collection from the ossiferous beds of Mt. Maraga, where the Pikermi fauna was found. Bogacheff found here the bones and skull of the first Russian mastodon, of the rhinoceros, lion, hyæna, giraffe, hipparion, and antelopes.

The Caucasus Museum is to be heartily congratulated upon the acquisition of so rich, varied, and important a series of collections; the cost of such an expedition would have been beyond the resources of the Museum, but a Mæcenas was found in the person of the President of the Caucasus Branch of the Imperial Russian Geological Society, General Yanushkievich, old friend and contemporary of A. B. Shelkovnikov, whose name cannot be unfamiliar to readers of this magazine.—M.B.

The December number of the *Jr. of Ent. and Zool.*, California, has an interesting article on the "Growth and Colour Patterns in Spiders," by Margaret L. Moles, illustrated by eight plates, two of which are coloured. In the summary of conclusions it is stated that (1) The young in all cases resemble the adult in shape of body, character of eyes and in habit. (2) Colour changes took place without the aid of moulting although the great changes took place at moulting. (3) Lack or abundance of food was a great factor in the rapidity of moults and colour development. (4) Heat and sunshine were also factors in the same. (5) Sexual differences in colour appeared late. (6) Great difference occurred in the amount of change in the colour pattern in different species. (7) The young ♂ resembles the adult ♀ in colour. (8) The eye emplacement of the immature is the same as that of the adult. (9) The ground colour of the immature is the same as that of the adult.

Part II. of the *Trans. Ent. Soc. Lond.*, 1916, was issued in December. It contains five papers and twelve plates, with sixteen pages of Proceedings. "On New and Little Known *Lagriidae* and *Pedilidae*," with two plates, by G. C. Champion, F.Z.S. "Gynandromorphous *Agriades coridon*, Poda; *A. coridon* ab. *roystonensis*, Pickett," with nine plates, by E. A. Cockayne, M.D. A most valuable paper, dealing with the subject under geographical range, family and hereditary character, anatomy of internal and external genitalia, psychology, external appearance, and theoretical discussion. "New Chrysids from Egypt and Algeria," by the Rev. F. D. Morice, M.A., with a map. "On Certain Forms of the Genus *Acraea*," by H. Eltringham, M.A., D.Sc., with a plate showing scales. Subjects dealt with in the Proceedings are:—Scent scales in the Pierids, especially *P. napi*: hatching of the eggs of a mosquito; egg-laying of *Trichiosoma tibialis*: a teratological example of a Coleopteron, with sketch showing additional tarsi and claws; new records of scents in male butterflies; further experimental breeding of *Papilio dardanus* and its polymorphic females. etc.

The *Irish Naturalist* for January contains an article entitled "The State of Ireland," which causes one "to think." After calling attention to the reduced membership of the various Natural History Societies, the falling off in the attendances at Field Club excursions, and the smaller circulation of the magazine, the writer considers the causes to be the increased specialisation of the modern student, the almost complete cataloguing of the animals and plants, and last but most potent of all "is undoubtedly" the "excessive attention bestowed, during the last twenty years, on Geographical Distribution." "As the poet says:—

"Primroses by the river's brim,
New County Records are to him,
And they are nothing more."

While recognising that Geographical Distribution is a necessary and proper scientific study the writer supports his attack with numerous instances where this line of work has been carried to absurd lengths, and urges a return to the study of living things, themselves, their physical characteristics, their adaptations and habits, and their reactions to the environment.

As we go to press the sad news comes to us of the death of Mr. A. E. Gibbs, of St. Albans.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

December 6th, 1916.—ELECTION OF SPECIAL LIFE FELLOWS.—Prof. L. C. Miall, F.R.S., Norton Way, N., Letchworth, and Col. J. W. Yerbury, F.Z.S., 2, Ryder Street, St. James's, S.W., were elected the first Special Life Fellows of the Society.

Scarce and Local Insects.—Mr. J. C. F. Fryer exhibited, (1) specimens of the beetle *Anthicus bifasciatus* and the bug *Lygus rubicundus*, two species which have only been recorded in Britain from a restricted area in Cambridgeshire and Huntingdonshire. (2) Specimen apples illustrating the serious injury caused by the bugs *Plesiocoris rugicollis* and *Orthotylus marginalis*, which appear to have adopted apple as a food-plant only within comparatively recent years.

Rhopalocera from Fernando Po.—Dr. H. Eltringham exhibited examples of *Papilio dardanus* ♂, taken by Mr. G. H. Bullock (British Vice-Consul at Fernando Po), near Santa Isabel, Fernando Po, and also a curious example of *Danaida chrysippus* f. *alcippus* taken near S. Isabel, Fernando Po, and entirely devoid of yellow pigment, the result being that the specimen had the appearance of a monochromatic representation of the insect.

A Colour-Association of Mylabris (Coleoptera) from S. Nigeria.—Prof. Poulton said that he had received a fine series of Mylabrid beetles, including many pairs *in coitû*, collected by Mr. C. O. Farquharson from "ground-nut," *Arachis hypogaea*, L. (*Leguminosae*, Tribe *Hedysareae*), at Moor Plantation (480-580 ft.), four miles west of Ibadan, S. Nigeria. The assemblage was found to break up into four species belonging to three genera or subgenera. Two of the species were new and each of them was represented by a variety sufficiently distinct to receive a name, as well as by the typical form.

Dr. G. D. H. Carpenter's notes on South-West Uganda and late German East Africa west of the Victoria Nyanza.—Prof. Poulton said that he had received several letters and boxes of specimens from Dr. Carpenter, and he felt sure that the Society would be glad to record his observations on this little-known area.

A scarce Longicorn.—Mr. O. E. Janson exhibited a specimen of *Thaumasus gigas*, Oliv., a rare and remarkable Longicorn beetle recently received by him from Venezuela.

Papers.—The following papers were read:—"New species of Hymenoptera in the British Museum," by Rowland E. Turner, F.E.S. "Descriptions of South American Micro-lepidoptera," by E. Meyrick, B.A., F.R.S., F.E.S. "Notes on some British Guiana Hymenoptera," by G. E. Bodkin, F.Z.S., F.E.S.

January 17*th*, 1917.—Annual Meeting.—The Annual Meeting was held on Wednesday, January 17th, Commander J. J. Walker, M.A., R.N., F.L.S., Vice-President, in the Chair.

No alternative names having been received the nominees of the Council were declared to be elected as Officers and Council for the ensuing year (see p. 18).

The Balance Sheet was read by Mr. R. Wylie Lloyd, one of the Auditors, and adopted on the motion of Mr. F. H. Wolley-Dod, seconded by Mr. G. E. Frisby.

Mr. Lloyd drew special attention to the recovery by the Treasurer of three years' Income Tax on the investments of the Society.

The Rev. G. Wheeler, one of the Secretaries, then read the Report of the Council, which was adopted on the motion of Mr. H. Main, seconded by Mr. W. J. Kaye.

In consequence of the absence of the President through illness, his Address was read at his request by the Rev. Jas. Waterston, who showed a number of lantern slides in illustration.

The Rev. F. D. Morice proposed a vote of thanks to the President, regretting his absence and its cause, and expressing the hope that the Address might appear in the Proceedings of the Society. The vote of thanks was carried unanimously, after being seconded by Mr. Hamilton Druce.

A vote of thanks to the Officers was passed on the motion of Mr. Stanley Edwards, seconded by Mr. J. Hartley Durrant, and each of the Officers said a few words in reply.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

October 12th, 1916.—A NEW ORNITHOPTERA.—Mr. Kaye exhibited a specimen of the new species of *Ornithoptera*, *O. joiceyi*, from N. Guinea.

MELANIC BRITISH TEPHROSIAS.—Mr. Newman, specimens of the extreme melanic form of *Tephrosia consonaria* from Kent, fine melanic forms of *T. consortaria* and an intermediate form, a series of var. *rossica* of *Callimorpha dominula*, and a bred series of *Dicranura bicuspis* from Tilgate Forest.

PURSE-GALLS ON POPLAR.—Mr. A. E. Gibbs, the purse-like galls on the petioles of poplar leaves caused by the Aphid *Pemphigus bursarius*.

FURTHER NOTES ON PARARGE AEGERIA.—Mr. Gibbs, a case of further specimens of *Pararge aegeria* var. *egerides* from S. Devon, sent by Dr. Perkins, and read a long series of notes on the characteristics, habits and dates of the various broods. In the discussion it was shown that besides passing hibernation in almost any stage of larval growth, the species could pass the winter as a pupa.

REPORTS OF FIELD MEETINGS.—The Report of the Field Meeting at Ockham and Wisley on May 20th, was read by Mr. Kaye the leader. Reports of the Field meeting to Clandon on June 24th, and to Box Hill on July 22nd, were read by Mr. H. J. Turner the leader.

October, 26th.—DEATH OF A MEMBER.—The death of a member, Mr. C. A. Briggs, F.E.S., of Lynmouth was announced.

ABERRATIONS OF A. MEDON.—Mr. H. Bowman exhibited underside aberrations of *Aricia medon*: 1, with discal spots on underside of hindwings represented by white splashes only; 2, ab. *obsoleta* with heavy striations of white.

EUDAEMONIA.—Mr. H. Moore, the W. African moth *Eudaemonia* sp. with hindwings produced to very long tails.

STEREOSCOPIC PICTURES OF PUPA.—Mr. Hugh Main, a stereoscopic picture of the stag-beetle shortly after pupation.

EXHIBIT OF SPECIES OF THE GENUS PARARGE, AND PAPER.—Mr. Curwen, a number of species of the genus *Pararge* from the continent of Europe, and remarked on the diverse habits of some of the species. Mr. Turner, examples of most of the species in the genus *Pararge* (*sen. lat.*) arranged as they are in the National Collection to show the sub-generic divisions, in illustration of his Paper, the "Genus *Pararge*," which he then read. A considerable discussion took place in which it was advanced that in a genus with a large number of species it was necessary to consider them in groups, that the giving of special names for such groups were much to be deprecated especially as they often had no particular significance when given, that in the case of the very large genus *Papilio* one spoke of a group by the name of a conspicuous member of it, *e.g.*, the *machaon* group, that the species sometimes fell naturally into groups by their habits, *e.g.*, *aegeria*, etc., shade loving, *megera*, etc., sun-loving.

OCCURRANCE OF A. PLEXIPPUS IN IRELAND.—Mr. Frohawk reported the occurrence of *Anosia plexippus* in Ireland and gave a resumé of the extension of the range of this species. A discussion then took place in which it was advanced that migration in many cases appeared to be a voluntary act.

November 9th.—NEW MEMBER.—Mr. G. W. Mason, of Ealing was elected a member.

LECTURE ON MENDELISM :—Professor Bateson, F.R.S., gave a lecture, with lantern slides and other illustrations, entitled "Remarks on the Mendelian Theories with special reference to recent extensions in their application made in America." Some discussion took place.

GYNANDROMORPH OF L. QUERCÛS.—Mr. G. F. Porritt exhibited a gynandromorph of *Lasiocampa quercûs* and an olive-banded male of the same species, together with a lemon-yellow male of *Cosmotriche potatoria*. The former from near Huddersfield.

LYCAENIDS OF THE SEASON.—Mr. Platt Barrett, British *Lycaenidae* taken this season.

November 23rd.—MELANISTIC A. APRILINA :—Mr. L. W. Newman, a series of very darkly marked bred specimens of *Agriopis aprilina* from Teesdale.

BRED C. DISPAR FROM HOLLAND, ETC.—Mr. Frohawk, a fine bred series of *Chrysophanus rutilus* from ova laid by a female from Holland and compared them with the Austrian race and British *C. dispar*.

LOCAL RACES OF P. MNEMOSYNE.—Mr. Turner, a long series of many forms of *Peronea cristana* and examples of various continental races of *Parnassius mnemosyne*.

EXTENDED EMERGENCE OF A. MEGACEPHALA.—Mr. Brooks reported that he had taken an imago of *Acronicta megacephala* on June 8th and another on Aug. 8th on the same trunk. It was supposed that the latter was a belated emergence.

A MYRMECOPHILOUS DIPTERON.—Mr. Blair, the living larvæ of the Dipteron, *Microdon* sp. an inhabitant of ants' nests, found among sphagnum from the New Forest.

A NEW HABIT OF VESPA VULGARIS.—Mr. Frohawk reported that he had noticed wasps collecting ears of corn in quantity from one portion of a field. This was quite a new habit.

LONDON NATURAL HISTORY SOCIETY.

October 3rd.—Mr. L. W. Newman, F.E.S, exhibited slate-grey males of *Agriades thetis* (*adonis*) and one showing a curious mixture of the two colours slate-grey and brilliant blue. The grey form has occurred before, but the mixed specimen is unique; all were found at one spot. The structure of these grey insects is extremely delicate, and to secure perfect specimens they must be taken drying their wings; otherwise they are invariably badly damaged. Mr. Newman also exhibited *Agriades coridon* vars. *roystonensis*, *inaequalis*, and *impar*, five having left side small wings and seven right side small wings, several females with blue streaks and also two with tawny streaks on the usual ground colour.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

October 14th, 1916.—As usual on the opening meeting of the session the evening was devoted to exhibits relating to the season's work. It was at once apparent that the war had affected our members, but if the quantity of material was less the quality was well maintained; most members reported a bad and uneven season with the consequent result that many of our favourite species had been scarce and also late in their appearance.

MICRO-LEPIDOPTERA.—Mr. F. N. Pearce had a large number of micro-lepidoptera chiefly from Delamere Forest; included in his exhibit was a short series of *Narycia monilifera* (*Solenobia melanella*) from Essex.

ABERRATIONS OF P. PRUINATA.—Miss D. I. Burne had a specimen of *Pseudoterpna pruinata* of a uniform clear ochreous yellow colour, its fine condition suggested that it was a natural yellow variation.

WYE VALLEY CAPTURES.—Mr. S. P. Doudney showed the following, all from the Wye Valley:—*Apatura iris*, *Argynnis aglaia*, *A. cydippe* (*adippe*), *A. paphia*, *Brenthis selene*, *Polygonia c-album*, *Strymon w-album*, *Epinephele jurtina* (*janira*), a xanthic aberration, *E. hyperantus*, *Pararge aegeria*, *Angerona prunaria*, *Zonosoma annulata*, *Asthena blomeri*, *Abraxas sylvata*, *Eupisteria obliterata*, *Minoa murinata*, *Eucosmia undulata* and many other commoner species.

CAPTURE OF A. CONVOLVULI.—Mr. J. W. Griffin, a specimen of *Agrius convolvuli* taken on a fence post at Leasowe, Cheshire.

LOCAL CAPTURES.—Mr. W. Mansbridge brought, from N. Staffordshire: *Eurymene dolobraria*, *Zonosoma pendularia* var. *decoraria* (*subroseata*), *Asthena sylvata*, *Macaria notata*, *Eupithecia satyrata* and var. *callunaria*, *E. plumbeolata* and a varied series of *Bomolocha fontis*; from Delamere Forest: *Aplecta nebulosa* var. *robsoni*, *Macaria liturata*, var. *nigro-fulvata* and *Eupithecia indigata*: from Witherslack: *Macaria alternata*.

LYCAENID ABERRATIONS.—Mr. H. B. Prince exhibited some fine varieties of *Agriades thetis* (*bellargus*) from Folkestone, including lead-coloured males and ab. *striata*, also many interesting species from other localities, among which were two examples of *Aglais urticae* with the orange-red colour replaced by dusky ochreous, also very blue female *Polyommatus icarus*.

November 20th.—NEW MEMBER.—Dr. George Granville Buckley, M.D., F.S.A., Holly Bank, Manchester Road, Bury, was elected a member of the Society.

PAPER.—Mr. F. N. Pierce read a paper entitled "Notes on the Genus *Ornix*," in which he reviewed the synonymy of the genus and mentioned having recently examined the types of the various species, with the cordial assistance of Mr. J. Hartley Durrant, at the British Museum. Mr. Pierce then took the several species in detail and after alluding to the difficulty of identifying captured specimens by the wing-markings, told how a little practice enabled one to correctly name any of the genus by an examination of the genitalia, and described how this could be done with certainty without damaging the insect for cabinet purposes. The author exhibited all the British species of *Ornix* in illustration of his paper including the species, which as the result of his investigation he had introduced to the British List, *viz.*:—*Ornix finitimella*, already known to occur on the Continent. An animated discussion followed and in the course of some remarks Mr. W.

Mansbridge exhibited the larval mines of *Ornix anglicella* and *O. avellanella.*

Mr. Pierce exhibited about 150 species of Micro-lepidoptera captured by the Rev. C. R. N. Burrows in his garden at Mucking, Essex. These included :—*Phtheocroa rugosana, Eupoecilia dubitana, E. atricapitana, Chrosis alcella, Conchylis dilucidana, Cnephasia nubilana, C. pascuana, C. chrysantheana, C. hybridana, C. genitalana, Sphaleroptera ictericana, Retinia buoliana, Tinea ferruginella, Poecilia albiceps, Ornix anglicella, O. torquillella, O. finitimella* and many species of *Lithocolletis* and *Nepticula.*

Autumn Lepidoptera.—Mr. W. A. Tyerman exhibited a number of autumnal species of Lepidoptera from the Wye Valley including *Polygonia c-album, Catocala nupta, Noctua rufina, Agriopis aprilina* and *Xylina ornithopus.*

Hybernating butterflies.—Dr. John Cotton shewed hibernating specimens of *Aglais urticae* and *Gonepteryx rhamni.*

Local Coleoptera.—Mr. R. Wilding had a fine exhibit of local Coleoptera among them the following, *viz.* :—*Anisotoma fulva, A. ciliaris, Ægialia rufa, Haemonia appendiculata, Nemosoma elongatum, Apion astralagi* and *A. sanguineum.*

December 18*th.*—New Members.—Messrs. Thomas Whittaker, Haldon, Barker's Lane, Ashton-on-Mersey, and G. Alan Griffen, 27, The Summit, Liscard, Cheshire, were elected members of the Society.

Presidential Address.—Dr. Cotton read the Presidential Address; he took for his subject "The Collecting Grounds round Liverpool." The address dealt in a descriptive manner with the various headquarters for Lepidoptera within easy reach of the city, the good things to be found in each, and was interspersed with many humorous anecdotes of experiences and adventures met with when in quest of rare local insects.

January 15*th*, 1917.—Paper.—Mr. Wm. Mansbridge read a paper entitled "Recent Experiments in Breeding *Aplecta nebulosa.*" This was supplementary to previously described results, and interesting because of the confirmation of an experiment in 1914, when var. *robsoni* was bred from moths of the typical form of markings. Attention was also directed to a recurring variation of leaden-grey ground-colour, for which the name *plumbosa* was proposed. The progeny of the various experiments were exhibited and an animated discussion ensued.

OBITUARY.

James Edward Rothwell Allen, M.A.

His friends will be pained to hear of the sudden death of "Allen of Enniskillen," by which name he was perhaps best known to entomologists. He was found dead in bed on December 12th last, the cause of death being heart failure following upon an acute attack of influenza.

Mr. Allen was born January 21st, 1866, at Padiham, Lancashire, his father being Unitarian Minister there. At the age of 12 he went to Manchester Grammar School, whence, having gained a gold medal and a scholarship, he proceeded to Pembroke College, Oxford. Taking his B.A. degree with Honours in Classics, he devoted himself to the scholastic profession, and was engaged at Hull, Ruthen, Galway, and Portora Royal School, Enniskillen. He remained at Portora 19 years, and his Head concludes his testimonial with the words, "I deeply regret the circumstances—which neither of us could control—which led to his leaving Portora." He was certainly a good all round man. His Oxford Tutor speaks of him as one of the best classical pupils he had ever had. In another testimonial he is stated to have "had entire charge of the Classics of the Sixth Form, together with Ancient and Modern History, and further taught Mathematics, French, History, and Geography, in various parts of the school." So the story goes on. "School magazine," "games," "lawn tennis," "an intelligent musician," and . . . . "a very accomplished entomologist."

No doubt the *busy-ness* of his life prevented Mr. Allen doing all he would have wished for entomology. As a matter of fact he did not publish much on this subject, in which he took so keen an interest. So far as the writer can trace his contributions to entomological magazines covered the years from 1890 to 1913. He was one of the first contributors to our Magazine, and continued to write for us until the last date, which practically coincides with his departure from Enniskillen.

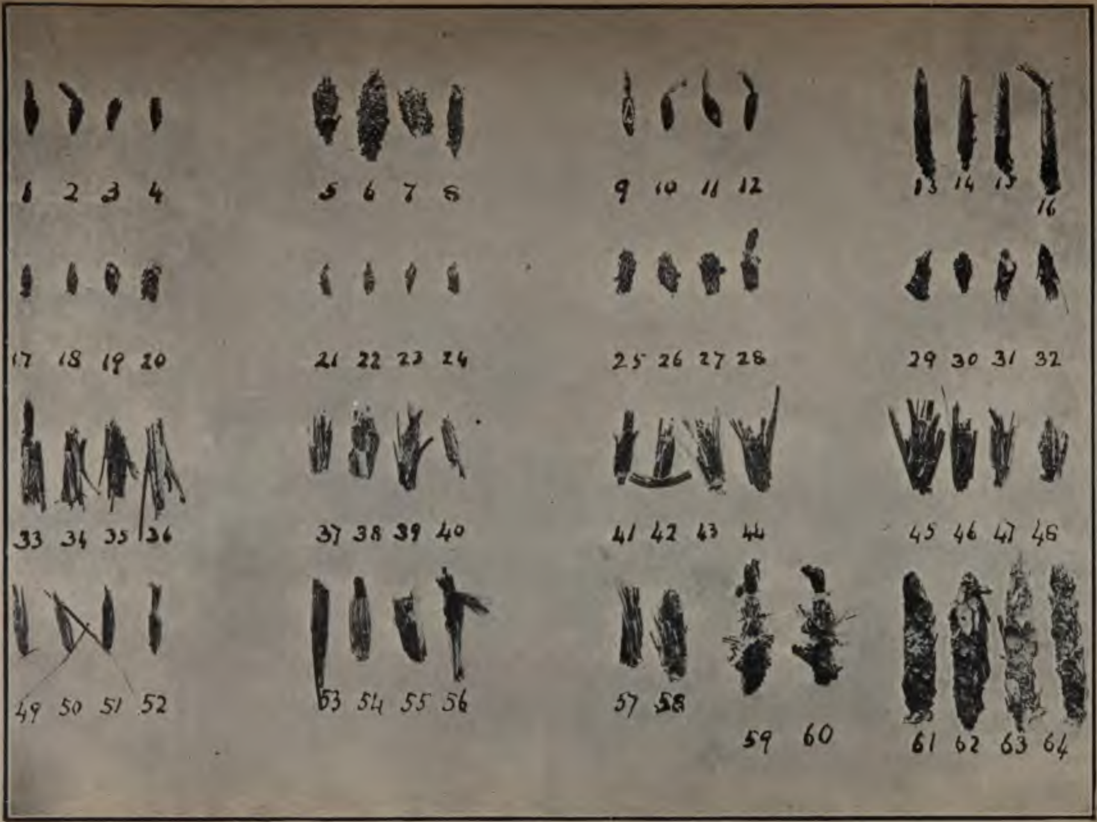
But he did some very good work. He will be specially remembered for his researches in the British species of *Oporabia* and bringing into notice the general occurrence of *O. autumnata*, previously a rarity in collections. He also threshed out the mystery of *O. christyi*, showing it to have a good claim to be regarded as a distinct species rather than a variety. He made various and systematic investigations on the crossings of the *Oporabiae*, the results of which have not been published in full. He was very successful in finding comparatively scarce species in out of the way places, as *Eupithecia jasioneata* in North Wales, *E. togata* in Galway, *Hydroecia crinanensis* in many different localities in Ireland, and an unlimited supply of that difficult insect *Emmelesia taeniata* also in Ireland.

Owing to his distance from entomological centres he was little known personally to English entomologists. As a correspondent he will be chiefly remembered. In a letter now before the writer occur the words, "I am very sorry to hear of the death of J. E. R. Allen. I don't think I ever met him, but very agreeable correspondence passed between us. He will be a loss to entomological circles." The writer can bear the same witness, as also to his generosity in sharing out his spoils, and the ungrudging supply of material for investigation, which marks the true scientist.

That was just the matter. He was too fully employed to do much in the way of contributing to the magazines, but he was an excellent correspondent, and always quick to convey any information which could be of interest or use.

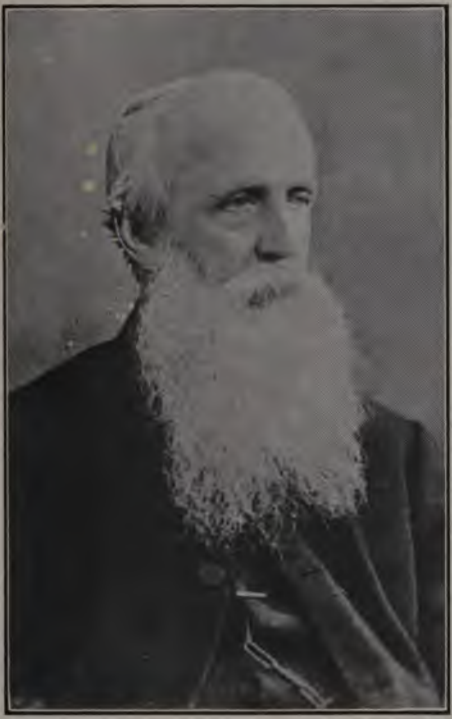
Like so many of us, he was "infected" with love of entomology in early years. "I think he was about eleven years old when he first began collecting. The postmaster of our village of Walmsley, Mr. McLean, a Scotsman, was a keen collector, and used to take the small boy on expeditions to New Brighton and other places moth hunting."

Leaving Enniskillen in 1914, Mr. Allen went to the Royal Grammar School, Worcester, in which city he died. He was laid to rest at Walmsley Chapel, Bolton, on December 16th, 1916.—C.R.N.B.



The Entomologist's Record.

LARVAL CASES OF BRITISH PSYCHIDS (natural size).



REV. OCTAVIUS PICKARD-CAMBRIDGE, M.A., F.R.S.

The British Psychides (*with a plate*).

By Rev. C. R. N. BURROWS, F.E.S.

The object of this note is to invite attention to a very interesting "group," or as I prefer to regard it, a "complete homogeneous group" of Lepidoptera, which, it would seem from the small amount of information available to the learner, has been much neglected in Britain. It is produced at this time of year, in order that the study may, perchance, incite the available entomologists—too old or too young for active service—to give their leisure to looking out for the cases of these insects.

I write as a learner myself. With the exception of the exhaustive treatment of the subject by J. W. Tutt (*British Lepidoptera*, vol. ii., 1900) I know of no serious attempt in the English language to grapple with this group. Readers of that treatise will recognise the author's characteristic effort to collect all available information, and his acknowledgment of the call for more energetic attempts to clear up the difficult problems connected with it.

The Psychides are a puzzling group of numerous species, evidently closely related and extremely difficult to separate. The study has been hampered by the prevailing idea of sharing them out between the Macro- and Micro-Lepidoptera, an idea slain by Tutt and to be buried by my study of the genitalia. Other efforts having produced but doubtful results, Dr. T. A. Chapman (whose investigations really form the backbone of Tutt's work) attacked the neuration, the antennæ, and the tibial armature of the imagines. A certain sum of results was attained, but many questions remained unsolved, especially as to how many species are passing under the name of *Fumea casta* (? *nitidella*, *roboricolella*, *intermediella*, etc.), and how many as *Epichnopterix pulla* (*radiella*, etc.). Dr. Chapman has generously placed the whole of his material at my disposal for examination of the genitalia, in the hope that this investigation may afford a solution of the problems, with the sole stipulation that the whole shall be finally deposited in the National Collection at South Kensington. I am using Tutt's classification of the Palaearctic Psychides (*loc. cit.*, p. 431), which I regret is too extensive to reprint with this. My present notes do not profess to cull observations published since the work quoted, but rather aim at recording my own observations.

In all species of these *Psychides* the larval cases are of paramount interest and importance. Every specimen collected should, if possible, be preserved with its case.

The species with apterous females are of necessity extremely localised, being unable to travel far. Wind, water, carriage by animals and birds, cartage of crops, would appear to be amongst the means by which they are dispersed. This would result in the formation of colonies, and colonies of distinct races, even species, in close proximity.

The ideal method of collecting will be the gathering of the cases, when the full-fed larvæ climb up and attach themselves to stems, tree-trunks, fences, posts, walls, or rocks for pupation. There appears to be no great difficulty in keeping the larvæ through the winter or in rearing from the eggs, in metal boxes—not too dry. The season for collecting the cases will be up to the time of emergence. I hope that the accompanying plate will at least suggest the forms to be sought. The cases may be divided roughly into (*a*) cylindrical or trigonal (Tutt tabulates some 88 species), (*b*) rough (5), (*c*) faggots (about 50), (*d*) helical, and (*e*) transversely covered. There are no helical case species so far found in Britain.

(*a*) Cases cylindrical or trigonal.

Narycia monilifera, Geoff.—Emerges end of May until July. Female winged. I have taken both sexes, about noon, resting on hawthorn, plum, and other tree-trunks in my garden up to July 26th, often quite near the empty case. I have also netted the male at dusk.

Diplodoma herminata, Geoff.—June and July. Female winged. I have taken the rough double cases on posts and tree-trunks from May 25th to June 27th, towards evening, especially after rain, crawling upwards. But these cases do not appear to produce imagines until the following year. I am now (March) rearing the insects from the cases which have wintered in a metal box, kept damp, upon my study table. As all the cases from which the insects emerge are lying loose upon the sand, I assume that the full fed larvæ are not in the habit of climbing up to pupate. My larvæ fed on insects and weeds until September, when they spun up to hybernate. I watered them in November, when they all woke up and began feeding again.

Solenobia inconspicuella, Stainton.--Late March to early May. I found large numbers of the cases and also imagines on palings, at Brentwood, 1886-7. Last year I found empty cases here on isolated posts in a field, and this year already I have found a lot of full cases on the same posts. The white heartshaped mark on some cases should be noted.

S. lichenella, L.—Of which no male is known. The female emerges early April to early May. Cases on old fences and posts, on walls and rocks. I have never come across this insect. Cases of Solenobias should be carefully sought and reared, as there are several other species known which may occur, or have been recorded as occurring in Britain. Specimens of *S. triquetrella* (♂s), *S. wockii* (?), *S. nickerlii*, and *S. clathrella*, have taken their places in British collections. The cases are small and somewhat difficult to find, but patience and careful searching may well meet with their reward.

Bankesia staintoni, Walsm.---March, and even February. Of this species I have no specimen. The case is trigonal in shape, and covered with sand. On palings and trunks. Only recorded from near Southampton Water: flying not uncommonly near spruce firs.

Bankesia douglasii, Stainton. -"In the spring, a single specimen," by Douglas, at Birch Wood.

Taleporia tubulosa, Retzius.---Late May to end of June. A large and tolerably well known trigonal case, on palings and trunks.

Luffia lapidella, Goeze.- Late June and beginning of July. When Tutt wrote, the male had not been taken in England. Case made of minute fragments of stone and lichen. On old walls and rocks.

Luffia ferchaultella, Stephens.--This probably common species is famous for its parthenogenetic powers. One is tempted to suppose that it is often confused with the previous species. The female (no male known) emerges in July. Stephens found it on old palings near Camberwell, and noted the activity of the larvæ during sunshine, and the esemblance of the case to a diminutive specimen of *Turbo littoralis* (a mall spiral land snail). This feature is very marked in the cases hich I have found, produced by particoloured rings of lichen, laid on y the larva, as growth necessitates enlarged premises. I am told that tainton's specimens of the case of this species preserved in the British useum, does not agree with Stephens' description, but I have not yself examined it.

(*b*) Rough cases.

Bacotia sepium, Speyer.—End of June into July. Said to frequent oods. Cases on lichen-covered trunks and branches of trees. Prob- bly could be beaten from such branches into an umbrella and collected rom the débris as 'they come up to the surface. It is spoken of as regarious, therefore once found there should be no difficulty in ecuring plenty of specimens.

Proutia betulina, Zeller.—June and into July. Case on lichen- overed trunks and branches, posts, moss covered walls, etc.

Proutia eppingella, Tutt.—Late June. I have no specimens of this nsect. Mr. Prout found a few cases in Epping Forest. The case is escribed as intermediate between *P. betulina* and *Fumea casta* (?). hey were found on a lichen-covered willow trunk.

(*c*) "Faggot" cases.

Masonia crassiorella, Bruand.—June and July. Should be looked or. It was recorded as British by Bond, Knaggs, and Mitford, and is ccepted as a native. The case is larger than that of *Fumea casta* (?)

Masonia affinis, Reutti.—Recorded as a var. of the last species; maller. The case is described as more bristly.

Masonia mitfordella, Chapman.—I have no specimen. There are no articulars recorded. Five specimens noted, all collected by R. Mitford. is smaller than *crassiorella*.

Masonia hibernicella, Chapman.—From Fletcher's collection. No etails or localities.

Masonia subflavella, Millière, and *M. edwardsella*, Tutt.—Are conti- ental species which might possibly be found in Britain.

Fumea casta, Pallas.—How many species have we under this name? ow far *nitidella*, *roboricolella*. *intermediella*, etc., are distinct, still emains to be proved. In examining the material in hand I find dis- inctions in the genitalia, which will have to be worked out. Generally peaking, the cases of the insect, or insects known by these names, are ound up to June, the imagines emerging in mid-June and through uly. Cases on fences, posts, tree-trunks, and on growing plants, ushes and scrub. The larvæ are very active during sunshine, quies- ent at night. Cases from the Highlands of Scotland and from moun- ains specially desirable.

Whittleia retiella, Newman.—End of May and into June. The case f this very local little species is found on the saltings at the mouth of he Thames, upon a small salt-marsh grass. The finding of it requires uch patience, and the expected bag always falls short of one's hopes. ne case in a whole day's work may almost be reckoned as a success.

Epichnopterix pulla, Esp.—May and June. Another insect about hose identity there is much doubt. The case, which is covered with rass *leaves*, not straw nor tiny sticks, is not often found. I have, however, seen it in profusion amongst grass outside the river-wall at Rainham, and once a single case ascending an ash trunk, on the railway bank near Mucking. The fact that very similar imagines are found in very dissimilar localities goes to suggest that there may be separate species.

Several varieties of *E. pulla* are named, and it is quite possible that these, and even other species, may yet be discovered in Britain. The case of *E. sieboldii*, Reutti, is given in my plate as a var. of this species.

(*d*) Transversely covered cases.

Sterrhopterix hirsutella, Hb.—June to mid-August. The prickly case of this species must have been found at one time more frequently than of late years, and very generally distributed about Britain. This case should be very carefully searched for. It is found on palings, tree trunks, and growing plants. It seems to be more or less a wood-loving insect.

Acanthopsyche opacella, H.-S.—April and May (to June in Scotland) The large case of this is covered with flat bits of leaf, stone, bark, and little sticks. It is found on tree-trunks, bushes, rocks and boulders. The male is said to spin up for pupation lower down than the female. I has been found in several localities in the south of England and the Highlands of Scotland.

I have been prevented by optical difficulties, and space limitations from illustrating the large cases of the remaining recognised British species, *Pachythelia villosella*, Ochs. They are well worth a figure, however and perhaps I may have an opportunity of presenting such later. The moth flies about June, but responds to the season. It is recommended to gather the cases during May. There are several named Continenta varieties, which may be separate species.

It may be added that probably the majority of these insects pas two years in the larval stage, and that they are largely polyphagous and even carnivorous.

I shall be deeply obliged to observers who find cases of the Psychide in unusual localities, in Scotland, Wales and Ireland, in mountainous places, on moors, or on sandhills, and can send me a share, as I need much more material for the examination of the genitalia, with a view to clearing up the difficulties which surround the group.

EXPLANATION OF PLATE IV.

1-4. *Narycia monilifera*, Geoff. = *melanella*, Haw., Mucking, 1916.
5-8. *Diplodoma herminata*, Geoff. = *marginipunctella*, Steph., Mucking, 1916.
7. Outer case. 8. Inner trigonal case.
9-12. *Solenobia inconspicuella*, Stainton, Mucking, 1916.
9. Shows white heart-shaped marking.
13-15. *Taleporia tubulosa*, Retz. = *pseudobombycella*, Hb., Brentwood.
16. ,, ,, T.A.C., no loc.
17-18. *Luffia lapidella*, Goeze. F. G. Whittle, Essex, 1897.
19-20. ,, ,, T.A.C., La Napouli, 1901.
21 & 24. *Luffia ferchaultella*, Stephens, Buxton, Kent, 1916.
22 & 23. ,, ,, Mucking, 1916.
25, 26, 28. *Bacotia sepium*, Speyer, T.A,C., Continental.
27. ,, ,, ? ,, ,,
29-30. *Proutia betulina*, Zeller, F. G. Whittle, Essex, 1899.
31-32. ,, ,, T.A.C., Continental.

33. *Masonia crassiorella* ♂, Bruand, T.A.C., Continental.

34. ,, ,, T.A.C., Locarno, 1899.

35 ♀ 36 ♂ *Masonia crassiorella* T.A.C., Continental.

37-38 ♀ 39-40 ♂. *M. affinis* (? var.), Reutti, T.A.C., Continental.

41. *Fumea casta* (?) Pallas, ? locality.

42-43 ♀. ,, ,, (?) Mucking.

44 ♀. ,, ,, (?) F. G. Whittle, New Forest.

45, 46, 48 ♀. ,, (?) Mr. Pearcey, nr. Bristol.

47 ♂. ,, (?) ,, ,,

49-51. *Whittleia retiella*, Newman, F. G. Whittle, Essex.

52 ♂. ,, ,, Essex, 1901.

53-56. *Epichnopterix pulla* (?), Esper, T.A.C., no loc.

57-58. ,, var. *sieboldii*, Reutti, T.A.C., no loc.

59-60 ♂. *Sterrhopterix hirsutella*, Hb., T.A.C., Continental.

61-64. *Acanthopsyche opacella*, H.S., T.A.C., Locarno, 1900.

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By Hy. J. TURNER, F.E.S.

(*Concluded from page 41.*)

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1908. Verity.—"Rhop. Pal.," p. 146, pl. xxxii. o.d. *pseudolerace*
1908. Verity.—"Rhop. Pal.," p. 146, pl. xxxii. o.d. *pseudobryonia*
1908. Verity.—"Rhop. Pal.," pp. 147, 167, pls. xxxii., xlix.
o.d. *euorient*
1908. Verity.—"Rhop. Pal.," p. 149, pl. xxxii. o.d. *carne*
1908. Verity.—"Rhop. Pal.," p. 150, pl. xxxii. o.d. *nigran*
1908. Verity.—"Rhop. Pal.," p. 138, pl. xxxi.
1908. Verity.—"Rhop. Pal.," p. 138. o.d. *transien*
1908. Verity.—"Rhop. Pal.," p. 141, pl. xxxi. o.d. *montan*
1908. Harrison and Main.—"Trans, Ent. Soc. Lond.," p. (lxxxvii
1908. Verity.—"Rhop. Pal.," p. 161, pl. 32, fig. 20. o.d. *minim*
1909. Frühstorfer.—"Int. Ent. Zeit.," vol. iii., p. 88.
o.d. *leovigild*
1909. Turati.—"Nat. Sic.," vol. xxi., p. 7.
1909. Rebel.—"Berge Schm.-buch.," ed. ix.
1909. Frühstorfer.—"Int. Ent. Zeit.," vol. iii., p. 88.
1909. Hemmerling.—"Int. Ent. Zeit.," vol. iii., pp. 42, 54, 62, 7
1909. Frühstorfer.—"Int. Ent. Zeit.," vol. iii., p. 88. o.d. *nes*
1909. Martin.—"Ent. Zeit.," Stutt., vol. xxxiii., p. 161.
o.d. *malayi*
1909. Schima.—"Verh. z.-b. Wien," vol. lix., p. (376).
o.d. *lutesce*
1909. Schima.—"Verh. z.-b. Wien," vol. lix., p. (377).
o.d. *bimacula*
1909. Schima.—"Verh. z.-b. Wien," vol. lix., p. (377).
o.d. *flavome*
1909. Schima.—"Verh. z.-b. Wien," vol. lix., p. (377).
o.d. *conflue*

1909. Schima.—" Verh. z.-b. Wien," vol. lix., p. (377).
o.d. *subtalba.*
1909. Frühstorfer.—" Int. Ent. Zeit.," vol. iii., p. 88.
o.d. *adalvinda.*
1909. Peyron.—" Morp. Skand. Schm.," p. 18, fig. 11.
1910. Verity.—" Rhop. Pal.," p. 331, pls. lix., lxvii.
1910. Reverdin.—" Bull. Soc. Lep. Genev., vol. ii., p. 46, pl. ii., fig. 3.
o.d. *posteromaculata.*
1910. Schima.—" Verh. z.-b. Wien," p. 268, etc.
1910. Stichel.—" Ber. Ent. Zeit.," vol. lv., p. 233.
1910. Schima.—" Verh. z.-b. Wien," vol. lx., p. 281.
(o.d. *bimaculata.*)
1910. Dufranc.—" Rev. Mens. Namur," vol. x., p. 48.
o.d. *lambillioni.*
1910. Schima.—" Mitt. Wien."
1910. Schulze.—" Int. Ent. Zeit.," vol. iv., p. 213.
1910. Stichel.—" Int. Ent. Zeit.," vol. iv., p. 11.
1910. Schima.—" Verh. z.-b. Wien," vol. lx., p. 284.
(o.d. *flavometa.*)
1910. Schima.—" Verh. z.-b. Wien," vol. lx., p. 287.
(o.d. *confluens.*)
1910. Schima.—" Verh. z.-b. Wien," vol. lx., p. 289.
(o.d. *subtalba.*)
1910. Verity.—" Rhop. Pal.," p. 331, pl. lix. o.d. *fountaineae.*
1910. Verity.—" Rhop. Pal.," p. 332, pl. xxxii. o.d. *britannica.*
1910. Verity.—" Rhop. Pal.," p. 332, pl. lix. o.d. *maura.*
1910. Verity.—" Rhop. Pal.," p. 332. o.d. *vitimensis.*
1910. Verity.—" Rhop. Pal.," p. 332, pl. lxvii. o.d. *aestiva.*
1910. Verity.—" Rhop. Pal.," p. 333, pl. lii. (o.d.) *bryonides.*
1910. Verity.—" Rhop. Pal.," p. 334, pl. xxxii. (o.d. *virida.*)
1910. Verity.—" Rhop. Pal.," p. 334, pls. xxii., lxvii. o.d. *arctica.*
1910. Turati and Verity.—" Fn. Valder.," p. 194.
1910. Turati and Verity.—" Fn. Valder.," p. 199. o.d. *bryonides.*
1910. Verity.—" Rhop. Pal.," p. 329, pls. lxvi., lix., xxxi., xxxiii., lxvii.
1910. Verity.—" Rhop. Pal.," p. 329.
1910. Verity.—" Rhop. Pal.," p. 330. o.d. *minor.*
1910. Verity.—" Rhop. Pal.," p. 330, pl. lxvii. o.d. *pseudonapi.*
1910. Verity.—" Rhop. Pal.," p. 330. o.d. *virida.*
1910. Verity.—" Rhop. Pal.," p. 331, pl. lii. o.d. *australis.*
1911. Schulze.—" Int. Ent. Zeit.," vol. v., p. 281.
1911. Heinreich.—" Int. Ent. Zeit.," vol. v., p. 95.
1912. Schima.—" Verh. z.-b. Wien," vol. lxii., p. (5).
1912. Duhrkorp.—" Int. Ent. Zeit.," vol. vi., p. 107.
1912. Noach.—" Int. Ent. Zeit.," vol. vi., p. 365.
1912. Main.—" Trans. Ent. Soc. Lond.," p. lxxi.
1913. Rangow.—" Int. Ent. Zeit.," vol. vi., p. 381.

The Coloration Problem. II.

By W. PARKINSON CURTIS, F.E.S.

(Continued from page 57.)

15. **Phylloscopus collybita,** Vieillot. The Chiff-Chaff.

Observer.—E. H. Curtis. Time.—?
Date.—June 17th, 1913. Sex.—♂ and ♀.
Place.—Canford, Dorset. Duration.—No record.

Food.—Micro-lepidoptera, species not ascertained. The parents were feeding young out of the nest. They hopped about spruce boughs and captured a good many individuals which they had disturbed. Their manner of hawking being not unlike that of the Flycatcher, *Muscicapa grisola*.

Observers.—E. H. Curtis and W. P. Curtis. Time.—12.30.
Date.—June 29th, 1913. Sex.—♂ and ♀.
Place.—Bere Wood, Dorset. Duration.—20 minutes.

Food.—A bird came to an oak tree and hovered up and down looking under the leaves. It fluttered the leaves as it flew, and a *Tortrix viridana* popped out and was caught in flycatcher style. Immediately the mate of this bird came and hovered in front of the foliage in the same way, then darted in and caught another *T. viridana* in the leaves. They then both hopped about in the leaves and got a few small micros of a grey colour, which it was impossible to identify. I can only say they were about the size and appearance of *Cnephasia subjectana*, but I do not attempt to name them even to giving them a family. After that the birds went off.

Observer.—W. P. Curtis. Time.—As below.
Date.—May 24th, 1914. Sex.—As given.
Place.—Canford, Dorset. Duration.—1½ hours.

Time.—12.5. Sex.—♀.
Food.—7 or 8 larvæ, mostly *Hybernia marginaria*.

Time.—12.15. Sex.—♀.
Food.—Hymenopterous insect caught on the wing.

Time.—12.17. Sex.—♀
Food.—Larvæ. ? species.

Time.—12.18. Sex.—♂.
Food.—Unidentified.

Time.—12.20. Sex.—♀.
Food.—Unidentified.

Time.—12.24. Sex.—♀
Food.—Larvæ. ? species.

Time.—12.30. Sex.—♂·
Food.—Ten larvæ. ? species.

Time.—12.32. Sex.—♂.
Food.—Mixture of small Diptera.

Time.—12.32. Sex.—♀.
Food.—Two larvæ of *Taeniocampa stabilis*.

Time.—12.35. Sex.—♀.
Food.—Unidentified.

Time.—12.40. Sex.—♂.
Food.—A collection of Geometer larvæ.

Time.—12.47. Sex.—♀.
Food.—Unidentified.

Time.—12.55. Sex.—♂.
Food.—Unidentified.

Time.—1 p.m. Sex.—♀.
Food.—Unidentified.

Time.—1.5. Sex.—♀.
Food.—Four green Geometer larvæ, not *brumata* nor *dilutata*, more like a *Cidaria*.

Time.—1.10. Sex.—♂.
Food.—Larvæ.

Time.—1.12. Sex.—♀.
Food.—Two or three larvæ.

[Note.—At 1.30 I left nest until 2.35. Resumed; particulars as before. Duration.—1 hour 15 minutes.]

Time.—2.46. Sex.—♂ and ♀.
Food.—Green larvæ, a number.

Time.—2.48. Sex.—♀.
Food.—One green Geometer larva.

Time.—2.50. Sex.—♀.
Food.—Unidentified.

Time.—3.12. Sex.—♀.
Food.—Unidentified.

Time.—3.35. Sex.—♀.
Food.—Five green Geometer larvæ.

Time.—3.40. Sex.—♀.
Food.—Larvæ.

Time.—3.50. Sex.—♂.
Food.—Unidentified.

[Note.—These birds were so quickly back and fro, that I know I missed them whilst writing in my note book.]

Observers.—W. P. Curtis and E. H. Curtis. Time.—8.30 a.m.
Date.—May 9th, 1914. Sex.—?
Place.—Canford, Dorset. Duration.—Casual.
Food.—Two chased a *Coremia ferrugata* but spotted us watching and bolted into the bushes.

[Note.—Here again difficulty arises in summarising owing to the observations of 7th and 29th June, 1913, but it was impossible to count, putting the most adverse construction possible I will count the first as two attacks, one by each parent, and the second as four successful attacks, two to each bird. I do not think it can be said that that is overstating the case, we then have 22 observations. Food identified 21 times. Lepidopterous imagines 7 times. Attack once incomplete.]

16. **Turdus musicus**, Linn., race **clarkei** (recte **clarkii, Hartert**). The British Song Thrush.

Observer.—E. H. Curtis. Time.—Morning.
Date.—June 1st, 1914. Sex.—Both parents.
Place.—Owslebury, Hants. Duration.—2 hours.

Food.—The young fed eleven times on snails or worms, and on one occasion with something else unidentified.

Same particulars as above. Duration.—1 hour 50 minutes.
Date.—June 1st, 1914.

Time.—11.1. Sex.—♀.
Food.—Green larva, like *Taeniocampa*, and other unidentified food.

Time.—11.12. Sex.—♀.
Food.—Worms and snails.

Time.—11.45. Sex.—♂.
Food.—One green and two brown Lepidopterous larvæ.

Time.—12. Sex.—♀.
Food.—A beakful of small green and brown Lepidopterous larvæ.

Time.—12.25. Sex.—♂.
Food.—Unidentified.

Time.—12.30. Sex.—♀.
Food.—Unidentified.

Time.—12.33. Sex.—♂.
Food.—Unidentified.

Time.—12.45. Sex.—♀.
Food.—Worms and snails.

Time.—12.50. Sex.—♂.
Food.—Brown and green larvæ.

Same nest, same details. Duration.—1 hour.

Time.—3.5. Sex.—♀.
Food.—Unidentified.

Time.—3.35. Sex.—♀.
Food.—Worms.

Time.—3.48. Sex.—♂.
Food.—Unidentified.

Time.—4. Sex.—♂.
Food.—Worms and something else.

[Note.—25 visits. Food brought every time. Food identified 1 times. No Lepidopterous imagines brought, but Lepidopterous larv 4 times.]

17. **Turdus merula**, L. The Blackbird.

Observer.—W. P. Curtis. Time.—Afternoon.
Date.—May 17th, 1914. Sex.—♀.
Place.—Canford, Dorset. Duration.—2 hours.

[Note.—Six visits were paid by the ♀, the ♂ never came at a As the ♀ persistently kept her back to me I never was able to see t food properly, but I thought that upon nearly every occasion it w worms.]

Observer.—J. T. Curtis. Time.—8 a.m.
Date.—June 20th, 1915. Sex.—♂.
Place.—Poole. Duration.—Casual.

Food.—"Whilst watering the front garden I saw a cock blackbird catch a brown moth and eat it; there was no mistake about it, the bird was only four or five feet from me." [I might say that my father is not an entomologist, and would therefore be unable to identify the moth in any case.—W.P.C.]

18. **Erithaca rubecula,** L., race **melophilus,** Hartert.
The British Redbreast.

Observer.—W. P. Curtis. Time.—?
Date.—April 27th, 1913. Sex.—?
Place.—Bere Wood, Dorset. Duration.—Casual.
Food.—Green larvæ.

Observer.—E. H. Curtis. Time.—?
Date.—May 17th, 1913. Sex.—♂ and ♀.
Place.—Bere Wood, Dorset. Duration.—No record.

Observer.—W. P. Curtis. Time.—?

A pair feeding young at the nest with brown and green larvæ, but mostly brown. No details kept.

Date.—June 25th, 1914. Sex.—?
Place.—Parkstone Lake, Poole. Duration.—Casual.

Food.—*Orgyia antiqua* ♂; the attack was ineffectual owing to the rapid manoeuvring of the insect.

Observer.—W. P. Curtis. Time.—Early morning.
Date.—June 18th, 1916. Sex.—?
Place. — Arrowsmith, Canford, Dorset. Duration.—Casual.

Food.—*Cabera pusaria;* bird was taking insect into its nest.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—May 3rd, 1914. Sex.—♂ and ♀.
Place.—Canford, Dorset. Duration.—2½ hours.

Food.—Seventeen visits were made to a nest of young with worms only. [Curiously enough I spent some time over this pair of birds myself as they came to a particular place for the worms, and I thought it was another pair feeding young where they were actually foraging. Later on, with the assistance of my brother, I established that it was the same pair that he was watching at the nest, and after some difficulty we actually saw them digging the worms out of rotten leaf mould.]

[Note.—Owing to the absence of details on May 17th, 1913, these results do not lend themselves to satisfactory tabulation, but fixing the purely empirical number of eight visits for May 17th, this gives the following:—28 observations. Food identified every time. Lepidopterous imagines twice, once only was the attack completed.]

19. **Luscinia megarhyncha,** Brehm. The Nightingale.

Observer.—W. P. Curtis. Time.—Morning and afternoon.
Date.—May 25th, 1913. Sex.—♀.
Place.—Bere Wood, Dorset. Duration.—6 hours.

FOOD.—None. The bird was sitting, and is here referred to because she made numerous and, as far as I could see, abortive attempts to catch any fly which passed near her, but declined to move from her eggs.

DATE.—June 1st, 1913. DURATION.—7 hours.
Other details as above.
NOTE.—The same antics were repeated on this occasion. Nest was subsequently destroyed I think by an adder.

OBSERVERS.—W. P. Curtis at the nest and E. H. Curtis in the neighbourhood from time to time. TIME.—As below. SEX.—As below.
DATE.—June 15th, 1913. DURATION.—2½ hours.
PLACE.—Bere Wood, Dorset.

TIME.—1.5. SEX.—♀.
FOOD.—Green caterpillar and something else I could not see.

TIME.—1.20. SEX.—♀.
FOOD.—Three large red worms (she went a quarter of a mile for these).

TIME.—1.33. SEX.—♂.
FOOD.—*Panorpa communis*.

TIME.—2.10. SEX.—♀.
FOOD.—Several flies. E.H.C. found she caught these by walking up and down a ride and picking them off the grass, and sometimes following them into the air, she deliberately searched and pounced very quickly.

TIME.—2.15. SEX.—♂.
FOOD.—*Agriopis aprilina* larva.

TIME.—2.33. SEX.—Unidentified.
FOOD.—Unidentified.

TIME.—2.44. SEX.—♂.
FOOD.—Unidentified.

TIME.—2.48. SEX.—♀.
FOOD.—Unidentified.

TIME.—3.0. SEX.—♀.
FOOD.—Unidentified.
NOTE.—The parents started feeding from the back of the nest at 2.33, hence the trouble in identifying the food. E. H. Curtis interrupted observations here.

TIME.—5.30. SEX.—♀.
FOOD.—E.H.C. again saw the ♀ in ride catching flies.
NOTE.—Ten observations. No Lepidoptera.

20. **Saxicola rubicola**, L. The Stonechat.

OBSERVER.—W. P. Curtis. TIME.—Afternoon.
DATE.—April 24th, 1913. SEX.—♂.
PLACE.—Canford Bottom, near Poole. DURATION.—Casual.

Food.—*Boarmia cinctaria.* The most that can be said of this is that it is a case of grave suspicion. I was working for this insect and had found a ♂ sitting head up. I had previously boxed a number sitting as usual sideways. I had to go to fetch further boxes. The insect was freshly emerged and perfect. I was returning to box this insect when I saw the bird go into the tree, so ran across quickly to find that the insect had a large piece torn out of one of the hindwings. I feel sure that I should have noticed a big piece of triangular shape gone from the wing, if that had been the case when I first looked at it. Not far away I found a ♀ with practically the whole of the forewing neatly bitten off.

Observer.—E. H. Curtis. Time.—Late afternoon.
Date.—May 15th, 1916. Sex.—♂ and ♀.
Place.—Canford, Dorset. Duration.—1¾ hours.

Food.—*Eupithecia nanata* and a micro unknown to E.H.C. The insects were taken on the wing at the rate of two or three a minute, but no detailed record was kept.

Observer.—E. H. Curtis. Time.—Early morning.
Date.—May 16th, 1916. Sex.—♂ and ♀.
Place.—Canford, Dorset. Duration.—1 hour.

Food.—E.H.C. kept no details of this, but noted 13 visits to the next, adding, "The food they brought was all small flies so far as I could see, and only once a small micro-moth of the species that haunts furze bushes." I surmise that E.H.C, means *Catoptria ulicetana.*

Same nest, May 18th, 1916. Duration.—Not recorded.

Food.—E.H.C. kept no details of food, but after various remarks about the birds, records, "the food of the *P. rubicola* seemed to be all insects, but I saw no Lepidoptera."

[Note.—The above is nearly impossible to summarise properly for want of details, though the records have an interest to which I shall advert later.]

21. **Oenanthe oenanthe,** L. The Wheatear.

Observers.—W. P. and E. H. Curtis. Time.—Afternoon.
Date.—September 27th, 1914. Sex.—?
Place.—Chapman's Pool, Dorset. Duration.—Casual.
Food.—Grasshopper.

22. **Accentor modularis,** L. Hedge Sparrow.

Observer.—W. P. Curtis. Time.—Afternoon.
Date.—May 2nd, 1914. Sex.—♀.
Place.—Canford, Dorset. Duration.—3 hours.

Food.—The young birds were very small indeed and were fed very rarely. I was not able to keep any detailed note of the food. The hen only fed them.

Same nest, May 3rd, 1914. Duration.—2 hours.
Time.—2.30. Food.—Tiny insects. ? order.
Time.—2.40. Food.—Tiny Diptera and (?) Hymenoptera.

Time.—2.55. Food.—Two larvæ of *Oporabia dilutata*.
Time.—3.10. Food.—*Culex* (several).
Time.—3.35. Food.—Diptera.
Time.—3.40. Food.—Diptera.

[Note.—No Lepidopterous imagines. Nest destroyed, probably by a stoat, on the 4th.]

23. **Hirundo rustica**, L. The Barn Swallow.

Observers.—W. P. and E. H. Curtis. Time.—12 noon.
Date.—October 26th, 1913. Sex.—?
Place.—Hamworthy, Poole. Duration.—Casual.

Food.—We saw ten or twelve birds picking insects off a Willow Tree, but we were unable to discover what the insects were. This is recorded here because the *modus operandi* was entirely strange to us. The birds hovered about amongst the upper branches searching, and every now and again stooped to pick up the food whatever it was. Occasionally they alighted to seize the insect, which appeared to be at rest, but not often, seeming to prefer to rely on their wings rather than to grasp the slender twigs with their feet. A powerful pair of binoculars failed to solve the difficulty as to what insect, but the whole proceedings were novel to us.

Observer.—W. P. Curtis. Time.—Just after sunset.
Date.—July 30th, 1916. Sex.—?
Place.—Arish Mell, Dorset. Duration.—Casual.

Food.—*Miana furuncula*, which was flying over a clover field in great abundance; the birds kept steadily at the slaughter as long as they could see; or perhaps as long as I could see what they were doing.

24. **Delichon urbica**, L. The House Martin.

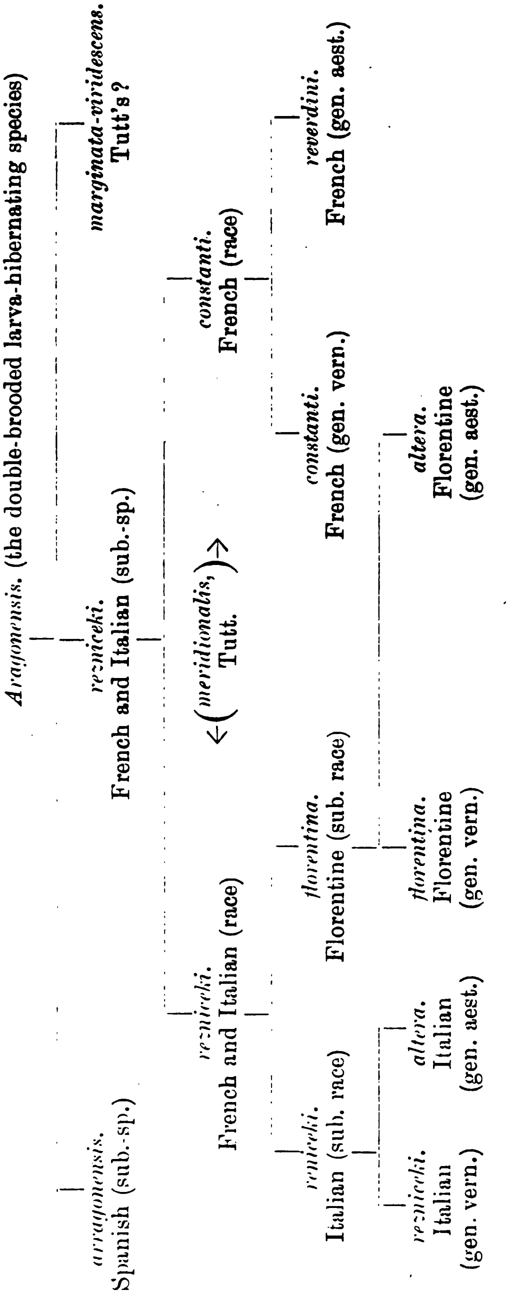
Observer.—W. P. Curtis. Time.—Midday.
Date.—July 31st, 1916. Sex.—?
Place.—Arish Mell, Dorset. Duration.—Half-an-hour.

Food.—The birds were apparently attracted by flies coming to sheep's droppings; but they were walking about in the grass, and occasionally rising and hovering as if they found the grass and their little feet impeded their movements too much. I definitely saw one Crambite (*Crambus tristellus?*) seized from a grass stem, but being without glasses so near the coast I was unable to determine with any facility what insects were being taken.

(*To be continued.*)

Nomenclature.

By Hy. J. TURNER, F.E.S.


Aragonensis. (the double-brooded larva-hibernating species)
arragonensis. Spanish (sub.-sp.)
rezniceki. French and Italian (sub.-sp.)
marginata-viridescens. Tutt's?
rezniceki. French and Italian (race)
← (*meridionalis,* Tutt.) →
constanti. French (race)
rezniceki. Italian (sub. race)
florentina. Florentine (sub. race)
constanti. French (gen. vern.)
reverdini. French (gen. aest.)
rezniceki. Italian (gen. vern.)
altera. Italian (gen. aest.)
florentina. Florentine (gen. vern.)
altera. Florentine (gen. aest.)

The above is the scheme of relationships of the various forms of the new species worked out by Dr. Verity.

Hence the name of the first brood of the Italio-French form of *aragonensis* is *Agriades aragonensis* sub.-sp. *rezniceki*, race *rezniceki*, sub. race *rezniceki*, gen. vern. *rezniceki*, or in the non-informative nomenclature

AGRIADES ARAGONENSIS REZNICEKI REZNICEKI REZNICEKI REZNICEKI.

Similarly the name of the first brood of the French form of *aragonensis* is *Agriades aragonensis* sub.-sp. *rezniceki* race *constanti* gen. vern. *constanti*, or in the non-informative nomenclature

AGRIADES ARAGONENSIS REZNICEKI CONSTANTI CONSTANTI.

An aberrational name could be added to each of these polynomials to a still further increase of perplexity.

It will be seen from these two examples that "position" (3rd, 4th, 5th, etc.) does not give relationship value as does the second (species-name) position, since one or more of the intermediates may not be in the series of forms. Even the 2nd position name does not show relationship in numerous instances, *e.g.*, its use by Frühstorfer, etc.

There must be absolute certainty and precision in definiteness with all terms used, otherwise misunderstanding is bound to arise, hindrance to progress, investigation on wrong bases, and endless muddle.

Lepidopterology.[*]

By T. A. CHAPMAN, M.D., F.E.S.

The twelfth Fasciculus of the *Lépidoptèrologie Comparée* consists of a thick volume of 528 pp. of text and nearly as thick a one of plates, 65 in number, of which 21 give further figures of the Phalaenites of Guenée (and allied species), and 11 of *Heliconia*, *Neptis*, *Phengaris atroguttata*, and other exotic species; both these sets of plates not only illustrate the species figured, but also M. Culot's inimitable genius as draughtsman and lithographer. Then there are 8 plates of the appendages of *Hesperia* from photographs pertaining to Dr. Reverdin's *Revision of the genus Hesperia*. There are also 25 photographs of the country in the Armorican peninsula, practically more or less environs of Rennes. With some of these we are told of a few of the characteristic Lepidoptera that are found in the locality, but all of which make a field entomologist wish he had such areas for collecting and observing at his command.

Dr. Reverdin's *Revision* will deserve fuller notice than this brief review permits.

The second paper is a very interesting account of, and discussion of, *Cimelia margarita*, H.G., by Mr. P. Chrétien, who has succeeded in rearing this rare, beautiful and puzzling species from the egg. Although he says that in making such observations, amongst other conditions "a certain degree of luck must also attend the hunter," and though he had some such luck in unravelling the life-history of *C. margarita*, we must recognise that such luck is of little use unless it happens to the right man, and M. Chrétien is to be congratulated on this bit of work. The moth is too rare to be known to many of the English collectors, who occasionally hunt on the Continent, so beyond noting that the larva feeds on *Euphorbia gerardiana*, and other Euphorbias, we may leave further of the interesting details to be gathered from M. Chrétien's paper, which is illustrated by four plates accompanying the text. The Guenéean revision occupies the next 108 pp. In this we note a reference or two to Barrett, but for the most part this important section of the Fascicule has little reference to Britain. M. Oberthür again points out very cogently the frequent unintelligibility of descriptions, which are quite worthless when the "types" are inaccessible or destroyed, and only place obstacles in the way of real progress. Descriptions (and figures in the plates) of various new and of previously unfigured species are given of Geometers from Algeria, Syria, and especially from the portion of China fronting Thibet. There are some observations on the circumstance that various figures by the old masters, Cramer, Stoll, Drury, Hübner, etc., do not quite agree with any known species; it is suggested that there are nevertheless such species, that the ancient authors are correct, and that the doubtful figures are not bad figures of known species. In illustration M. Oberthür recalls a circumstance, that few now remain with any first hand memory of, that *Papilio antenor* and *P. antimachus* of Drury were held some fifty years ago as doubtful entities, and that one specimen of the latter, the first recent one, was obtained by Hewitson as the result of an expedition costing him about £100.

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[*] *Études de Lépidoptèrologie Comparée*, par Ch. Oberthür, Fasc., xii.

The next paper continues the account of the Lepidoptera of Barbary. This runs to some 250 pp., and consists largely of Mr. H. Powell's observations in Algeria, all of which is of great interest, giving habits and life-histories of many species, but not lending itself to any abbreviation. SPHINGIDÆ, ZYGÆNIDÆ, HETEROGYNIDÆ, LYMACODIDÆ, NOTODONTIDÆ, LIPARIDÆ, with much detail on *Orgyia*, LASIOCAMPIDÆ, with details and life-history of *Chondrostega*, LEMONIIDÆ, with details of early stages, life-history of *L. vallantini*, SATURNIIDÆ. DREPANIDÆ and MEGALOPYGIDÆ, in which many points are dealt with by Mr. Powell about the genus *Somabrachys*, of which he has made so exhaustive a study of many species; this runs to about 50 pp. After several short papers there follows, "Considerations on several species of *Lycaena*," dealing chiefly with those inhabiting Brittany, the neighbourhood of Rennes, of which the photographs already referred to form illustrations, and some of the local conditions are described. *Plebeius argus* (*argyrognomon*) is very fully described, *Lycaena alcon* is also noticed, and *L. arion* is dealt with, with transcript of papers from the *Trans. Ent. Soc. Lond.*, 1915. One notes with pleasure that M. Oberthür and Mr. Powell intend next summer to study various phases of the Symbiosis of ants and *Lycaena* larvæ, in that rich Armorican country. M. Oberthür concludes with some observations on several puzzling questions as to species and their evolution.

NOTES ON COLLECTING, Etc.

DATES OF APPEARANCE.- It would be very useful to obtain during the season, times of the first appearance of the butterflies, and I would be very glad to correspond with any collectors and exchange dates of emergence of the various species, as met with, in various counties. So often a journey is made, only to find the particular insect either worn or not out, owing to the forwardness or otherwise of the weather. Of course dates vary according to the northern, midland or southern situation of the particular county; for instance I find *Leptosia sinapis* fully out in mid May in the South, whilst in the Midlands it is not in full flight until the second week in June. By this means, too, one could get notice of the abundance of species that rarely occur, such as *Colias edusa*, *C. hyale*, etc. Usually one only learns at the end of the season that a particular species has been common. Perhaps any entomologist to whom the idea appeals will communicate with me.—S. G. Castle Russell, "Monkswood," Woking, Surrey.

CURRENT NOTES AND SHORT NOTICES.

The *South-Eastern Naturalist* for 1916, the annual issue of the Transactions of the South-Eastern Union of Scientific Societies, contains matter which only very broadly can be considered as natural history, yet as usual the volume is a most interesting record and there are some valuable educational papers. The first fifty pages or so contain official matter, the annual report, reports of the sections, botanical, regional and treasure trove, the library, the spring and the autumn meetings, etc. Some twenty pages are taken up by the Proceedings of the 21st Congress held in June, giving an account of the meetings, a resumé of the discussions and interesting details of the visits to places of local interest. Then follow further twenty pages devoted to an annotated list of the *Hepaticae* and Mosses of Tunbridge Wells, the Congress town of the year, by W. E. Nicholson, which had been too late for insertion in the official Guide to Tunbridge Wells issued for the Congress. The special papers read take up nearly seventy pages but none of them deal with any branch of zoology. A further twenty pages deals with other official matter. Messrs. Alfred Sich, F.E.S., and Hy. J. Turner, F.E.S., are the Union's referees for matters lepidopterological, and the following instructions to correspondents may be found of use elsewhere:—

"Specimens, especially if small, should be in good condition, and sent in wooden, metal, or corked entomological boxes, with a copious packing of shavings or cotton wool outside, covered with stout paper securely stringed. Living perfect insects should have fixed in the box a rigid perch, such as a stout grass stem, to cling to, and should be sent singly. Unset perfect insects can be laid between cotton wool in metal boxes with little outer packing, but if set require most perfect packing. Larvæ can be sent in similar boxes, with an immovable spray of the food plant enclosed. They must not be crowded or they will sweat. In addition a sufficiency of the food-plant should be sent as an aid to identification. Eggs can be sent between cotton wool in metal boxes, or inserted in a small quill or a hole in a block of wood so that they may not rattle. Pupæ must each be separately wrapped firmly, but not tightly, in cotton wool, and placed in a rigid box with copious outside packing. The address should be placed in and on the parcel and on an attached luggage label with the stamps."

The *Naturalist* for January contains a summary of the year's (1916) scientific work of the Yorkshire Naturalist's Union. In the Lepidoptera B. Morley announces that black specimens of *Ematurga atomaria* have now been taken on all the moors in the S.W. Riding, and that the larvæ of *Tethea subtusa* have been locally in abundance. W. J. Fordham reports shortly on the Coleoptera. Hymenoptera, Diptera and Hemiptera are dealt with by Rosse Butterfield, who reports the occurrence of the aquatic fairy-fly, *Cataphractus cinctus* of Haliday, and the finding of *Vespa germanica* for the first time in the W. Riding. W. Falconer reports on the Arachnida, accounts of which have already appeared in four papers published in the *Naturalist* during the year.

The *Entomologist* for January contains some interesting details of the life-history of *Gonepteryx cleopatra*, including an attempt to naturalise it, by Capt. E. Bagwell-Purefoy, F.E.S.

In the *Ent. Mo. Mag.* for January F. N. Pierce announces a species of *Gracilariidae*, *Parornix finitimella*, as new to the British List. It has been obtained at Colchester, Mucking, Hartlepool, and other places. Hitherto it has been confused with *P. anglicella* and *P. torquilella*, but agrees perfectly with Zeller's type of *P. finitimella* by its genitalia.

In the same number Dr. R. C. L. Perkins announces and describes a species of *Psammochares* (*Pompilus*) (Hymenoptera) as new to science under the name of *P. cardui*. It has occurred both in the Forest of Dean and at Stanmore, Middlesex, bred from cocoons found in dead thistle stems.

In the *Scottish Naturalist* for January Percy H. Grimshaw has commenced a useful article on the "British Lice (Anoplura) and their Hosts."

SOCIETIES.

The South London Entomological and Natural History Society.

December 14*th*, 1916.—The Annual Exhibition of Varieties.—Mr. W. J. Kaye, on behalf of J. J. Joicey, Esq. (1) A gynandromorph of *Papilio lycophron* from Peru. (2) The first known female of the Brassolid *Polygrapha cyanea* closely resembling an *Opsiphanes* sp., from Ecuador. (3) A yellow aberration of *Zygaena trifolii* from Watergate. (4) A yellow form of *Zygaena filipendulae* from Tenby, an aberration confluent on left wing only, an aberration intermediate between yellow and red, and a fine ab. *chrysanthemi*.

Mr. Kaye, also for Mr. Joicey, twelve new forms of *Heliconius melpomone* from French Guiana, representing a wholly new phase of variation in the species, and read notes on the relationship of the forms.

Mr. Kaye's own exhibit was a cabinet drawer of the Ithomiine genus *Leucothyris*, composed of transparent insects with black marking and read notes on the significance of the varied markings exhibited.

Dr. Cockayne, an aberration of *Polygonia c-album* in which the two large costal spots are united and the hindwings are almost entirely black.

Dr. Chapman, males and females of two pairs of Lycænid species, of which one of each pair has only in recent years been differentiated, *viz.*, *Callophrys avis* from *C. rubi* in the Riviera and *Latiorina pyrenaica* from *L. orbitulus* var. *oberthüri* in the Pyrenees. He also showed the double-brooded S. European *Agriades* which Dr. Verity differentiates from the single-brooded *A. coridon* with the name *aragonensis*.

Mr. Leeds, a long series of Lycænids and their aberrations largely from Herts. *Polyommatus icarus*, ab. *caerulea*, streaks replacing dots on underside, brilliant blue females, ab. *melanotoxa* (ab. *arcua*) ♀; *Agriades coridon*, orange ringed spots on hind margin ♂, black suffusion extended in ♂, pale buff ♀, white wedges between nervures in ♀, black marking elongated underside ♀, etc.; *Bithys quercûs* ♀ dark-blue patches instead of purple; *Epinephele jurtina* ♂ with bleached central patches on all wings; *Coenonympha pamphilus* ♀ straw coloured, ♂ dark fulvous colour; *Epinephele tithonus* ab. *mincki* yellow, with extra spots, several with 1, 2 or 3 extra spots on the upperside, one with complete absence of spots, etc.

Mr. Newman, for Mr. Percy Richards, a fine collection of preserved larvæ of British Lepidoptera, which had been hand-painted in their natural colours.

For Mr. G. B. Oliver, Mr. Newman exhibited a fine series of aberrations of *Agriades thetis* including ab. *obsoleta*, ab. *semi-obsoleta*, striated forms, one with ground colour creamy white, a leaden coloured upperside, one ♂ leaden and blue mixed; many aberrations of *Polyommatus icarus*; and *Coenonympha pamphilus* with spotless underside.

For Signor Piazzo, Mr. Newman showed a fine *decoraria* (*subroseata*) form of *Zonosoma pendularia*, which had a conspicuous white line between the dark outer border and the red suffusion.

Mr. Newman's own exhibits were (1) a series of bred *Celerio gallii* from Cornwall; (2) hybrid *ocellatus* × *populi* with much variation; (3) many aberrations of *Amorpha populi*: (4) unicolorous black examples of *Eupithecia lariciata* from Warwickshire; (5) a series of the new species of British Geometer which has recently been differentiated from *Lampropteryx suffumata* by the Rev. W. Metcalfe, and somewhat resembling *Eustroma silaceata*. It was from a new locality.

Rev. A. T. Stiff, (1) many aberrations of *Epinephele tithonus* including xanthic, bipupillate, and extra-spotted forms, with a male having pale bars on the hindwings; (2) a pale *Hypocrita jacobaeae*; (3) a large *Coenonympha pamphilus* with black ocelli on hindwings, a bipupillate ♀, and a ♂ with minute apical spot on underside.

Mr. Porritt, a very fine series of extreme forms of *Abraxas grossulariata* ab. *nigrosparsata* from Huddersfield.

Mr. West (Greenwich), for the Society, twelve drawers of the Freeman collection of European Butterflies.

Mr. G. C. Russell, (1) many aberrations of *Aphantopus hyperantus*, including ab. *caeca*, ab. *arete* and ab. *lanceolata*, etc., mostly bred from ova from N. Hants; (2) a fine blue *A. coridon* and an unusually pale specimen, without dark margins; (3) a gynandromorphic *Saturnia pavonia*; (4) *Deiopeia pulchella* taken in Surrey in June 1913; and (5) *Mimas tiliae* lacking the four spots on upperwings.

Mr. Buckstone several series of *Selenia lunaria*, successive broods from a Teesdale female and read notes on the broods and specimens and on the variation shown.

Mr. Bowman, specimens of *Zonosoma pendularia*, including specimens with pink markings absent, with pink suffusion between the marginal lines, a new form with all wings suffused with a dark purple, one with marginal dots elongated into striæ, and forms in which a white line appears between the dark area and the pink suffusion.

Rev. J. E. Tarbat, a ♀ *A. coridon* without trace of marginal spots, an ab. *obsoleta*, and a ♀ with the marginal spots coalesced, and an asymmetrically marked *Mimas tiliae*.

Mr. Prideaux, a series of aberrations of ♀ *P. icarus* and an example of *Rumicia phlaeas* ab. *schmidtii* (yellow).

Mr. Edwards, exotic *Papilionidae* and species of the genus *Eurania.*

Mr. H. Moore, a box of specimens of species showing the same kind of deformity as ab. *roystonensis* of *A. coridon* to support his contention that they are cripples and not worthy of distinctive names.

Mr. C. P. Pickett, a drawer of representative specimens of *Angerona prunaria*, the results of nineteen years breeding, and read notes on his experiments with coloured environment. He also showed a long series of ab. *pickettaria*. Mr. Pickett also exhibited several drawers of *A. coridon* aberrations taken in the Herts district in 1916, and read notes on the various forms met with.

Mr. R. Adkin, series of *Polyommatus icarus* from many outlying parts of England, Scotland, Ireland and the islands, and compared the races as to size, colour and markings.

January 11th, 1917.—DECEASE OF A MEMBER.—The death of Mr. J. Platt Barrett, F.E.S., was announced.

LATE EMERGENCE OF H. DEFOLIARIA.—Mr. Brooks reported *Hibernia defoliaria* taken by Mr. B. S. Williams quite freshly emerged in January.

AFRICAN LEPIDOPTERA.—Mr. Moore, *Mimiodes discolor* and the deep green Sphingid, *Euchloron megaera*, from S. Africa.

CAPTURES OF THE SEASON IN THE WYE VALLEY AND IN STAFFORDSHIRE.—Rev. F. M. B. Carr, his captures of the past season in Staffordshire and in the Wye Valley, with *Agriades coridon* aberrations from Royston, and including *Leptosia sinapis*, *Brenthis selene*, *Eulype hastata*, *Venusia cambrica*, etc.

PAPER.—Mr. Hugh Main, a cage made by him to facilitate the breeding of *Geotrupes* beetles and to allow of full observation of the digging of the galleries, massing the pabulum, laying the ova, feeding and growth of the larva, etc., etc., and read a paper, "On Rearing beetles of the Genus *Geotrupes*," his observations being frequently at variance with those previously recorded.

OBITUARY.

Rev. Octavius Pickard-Cambridge, M.A., F.R.S., etc.

The great pioneer in this country of the study of Spiders, the Rev. Octavius Pickard-Cambridge, passed away on March the 9th, of this year, having been born on November 3rd 1828. Nearly the whole of his life was spent at Bloxworth in Dorsetshire. Even at the early age of eight he collected Lepidoptera, and although in later years much of his study was turned to "other orders," he always kept in touch with the butterflies and moths of his own country. He was a first-rate all-round naturalist and at one time had a large collection of Birds. He studied for the Church at Durham University, 1856-58, graduated B.A. in 1858, and M.A. in 1859. For a short time he was Curate at Scarisbrick in Lancashire, 1858-60, and then went to Bloxworth, of which he became Rector in 1868, retaining this duty till the day of his death. He married in 1866 and five sons survive him. In 1887 he was elected a Fellow of the Royal Society.

He was one of the now very few remaining links with the entomological workers of the last generation. Frederick Bond was his friend and co-worker and John Blackwell consulted him in the great work which he wrote on British Spiders. Fred Smith, H. T. Stainton and Prof. Westwood were his close intimates. Later in life he collected much in Dorset with Messrs. Nelson Richardson and Eustace Bankes, and corresponded with most of the entomologists of his time. From time to time he corresponded with Darwin and was one of the early supporters of the hypotheses of the great naturalist, taking an especially strong view about sexual selection and the view that species were still in process of formation. Russel Wallace he often met and in his correspondence with him frequently furnished him with notes and observations bearing on the problem of natural selection and other kindred subjects.

His practical natural history study was mostly done at Bloxworth and in the neighbourhood, as well as in that peculiarly specialised area the Isle of Portland. In the "fifties," however, he was much in the New Forest. An interesting account of a revisit to this classic hunting-ground in 1895 was written by him in the *Entomologist*, vol. xxix., p. 88. Apart from a long tour through Egypt, Palestine, Austria and Italy, 1864-5, and a few visits to Scotland, his collecting was in the county of Dorset.

The works which he wrote on the Arachnids are among the classics of the subject, and probably hardly any naturalist has described and recorded so many species. Collections from all parts of the world came to him and his aid and his opinions were consulted on all that was done in this order. The descriptive part of Moggridge's *Harvesting Ants and Trapdoor Spiders*, 1874, was written by him. In the *Proc. of the Zool. Soc.* he described the "Spiders of Palestine and Syria," 1872, in the same serial appeared descriptions of the "Spiders of Egypt," 1876. Perhaps the work which has had most attraction for naturalists in this country is his *Monograph of the Spiders of Dorset*, 1879-81, in which all the British Species of Spider known at the time were dealt with. In 1885 he described the spiders captured during the Yarkand expedition, and in 1889 appeared his *Monograph of the British Phalangidae or Harvestmen*. All the *Arachnida* taken during the famous "Challenger" expedition were described by him; and later most of the material for the Arachnid portion of the *Biologia Centrali Americana* passed through his hands to be dealt with for description and figuring; and in addition he contributed very numerous papers, records, descriptions, etc., to the magazines and periodicals. All his work was illustrated by his accurate and delicately executed drawings.

Of Lepidoptera he had a practically complete collection of the British species, all of which were, with a very few exceptions, captured by himself, as he had a strong dislike to anything approaching formal "exchange," although he was at all times ready to give freely to others and delighted to help the young collector. Of some of the rarer older species he had fine series. The only British specimen of *Hypena obsitalis* is in his collection and there are the two specimens of *Everes* (*Lycaena*) *argiades*, which his sons took in his own neighbourhood. His series of the Microlepidoptera are said to be especially fine and well set; with his friend Mr. Eustace Bankes he had worked very assiduously at this group during the latter part of the last century. He seemed indefatigable as a worker, collecting any insects which came in his way, while specially devoting himself to the pursuit of spiders and Lepidoptera. I had almost forgotten, that for the rediscovery of *Buckleria paludum* in this country we have to thank our departed co-worker, who met with it in some numbers at Bloxworth in 1886, where the *Drosera* grew in abundance.—H.J.T.

Arthur Ernest Gibbs, F.L.S., F.Z.S., F.E.S., &c.

In the death of of Mr. A. E. Gibbs, many of our societies have lost a constant attendant, a frequent contributor to their proceedings, and an indefatigable worker in all their various activities. He was a Fellow of the Linnean, the Zoological, and the Entomological Societies, of the last of which he had been on the Council for more than one term and was a leading member of its business committee, where his knowledge of printing had been of great assistance. At the time of his death he was serving his second year of office as President of the Hertfordshire Natural Society, in which position he had succeeded Lord Rothschild; he was also a Vice-president of the South London Entomological Society and would probably have become president in due course, and he had been for some years on the Council of the Ray Society. He was a member of the London Natural History Society, and also a Fellow of the Royal Horticultural Society.

Born in 1859 at St. Albans, Herts, where his ancestors for several generations had been in business as large printers, he was always keenly alive to anything which would benefit his native city. When a county museum was suggested, he not only lent the columns of the "Herts Advertiser," but advocated its establishment in season and out of season, with the success his efforts deserved. His work did not end there for when built he gave largely and induced others to give, specimens for exhibition, often arranging them himself from a specially educational point of view. His enthusiasm did not even end with this matter of success, for only a few days before he passed away he expressed his pleasure to the writer that he had lived to see the museum building practically doubled in size largely through his work. It was natural that his fellow townsmen should recognise his valuable assistance and we find him serving on all the important bodies of the city, at one time or another, even having the civic chair offered to him. The Building Society, the Gas Company, the Educational authorities all claimed his services, and in the latter he did much useful work.

His earlier study was devoted to the British Lepidoptera, of which he possessed an excellent working collection, including some striking aberrations, and recently questions of the distribution and local disappearance of British species had occupied much of his attention. His presidential address to the Herts N. H. Society dealt with these last questions in the case of *Pararge aegeria*.

Another phase of his interest in the British species was that of the records of his native county. For many years past in the *Trans. of the Hertfordshire Nat. Hist. Socy.* summaries of recent occurrences and discoveries of insects of all orders have appeared under his name and that of his friend Mr. Barraud. In conjunction with the latter gentleman, a very full annotated "List of Hertfordshire Diptera" was published in these Transactions a few years ago.

For many years Mr. Gibbs had spent his summer holidays on the continent, and various out of the way places had been visited by him. Although the higher regions of the Alps did not suit his health, he had travelled and collected insects largely in Switzerland, the Vosges Mountains, the Eastern Pyrenees, Corsica and the Balkans, and on one occasion he spent several weeks in Algeria.

These European tours led him to give much consideration to the Palæarctic Rhopalocera many species of which he got to know in their native habitats, and he was always anxious to get into correspondence with collectors in the less easily worked districts, such as Spain, Corsica, Cyprus, Central Italy, Sicily, etc.

In looking through his library one finds many albums of views illustrative of his various journeys. He invariably took a camera with him and was accustomed on his return home to give a pictorial account of his experiences, both locally and to the societies, of course from different points of view. On his Balkan trip in 1912, just before the Serbo-Turkish war, it was a constant source of regret to recall his misfortune to find that all the photographs which he took in Herzgovina and Montenegro were spoiled by a defective camera, a new one by the bye.

Latterly he had devoted much time to the study of the Lepidoptera of Central America, of which he had formed a considerable collection, mainly of specimens sent to him direct by his collectors. In working out his consignments he made much use of the S. Kensington (Brit. Mus.) collections, and was accustomed to place there types of any species which he described, as he recognised this practice to be a duty which should be universal.

On subjects in which he took an interest he was ready to impart information, and in a manner chatty and agreeable, terse and business like, and always replete with facts and experiences local and personal.

Mr. Gibbs was not a voluminous writer but extended notes of an educational nature are numerous in the pages of most of our magazines and proceedings of societies, with accounts of observations made on his various journeys into out of the way parts, and summaries of facts and suggestions for further study, all written with ease and lucidity.

He was always ready to help others in their study and to do aught for the advancement of the Science he loved so well.

The writer of these notes looked upon it as one of the "Pleasures of his Life" to spend a day with him, divided between enjoying his beautiful garden at Kitchener's Meads, consulting his fine collections, helping him to work out a more or less abstruse point of identification by means of his capital library of useful entomological books, or wandering in some remote part of Hertfordshire, where new county records were possible.

When the S. E. Union of Scientific Societies visited St. Albans some years ago, it was A. E. Gibbs who took upon himself the burden of being local secretary and all those who were present at that Congress know full well what a delightful time was spent and how smoothly everything went. The success of the meeting was a meed of the thorough organisation which he initiated.

As one of the heads of a large publishing establishment, producing three weekly newspapers, he had for many years spent a very busy life, and there is no doubt that the worries of the times helped to break down a constitution, never very robust, which had been worked to the utmost. For three months he struggled bravely against growing weakness, and in spite of devoted attention, he succumbed at last, passing peacefully away on March 3rd, in his native city of St. Albans, at the age of 58, leaving his wife and three daughters, the eldest of whom is passing a successful career at Oxford, to mourn their loss.—H.J.T.

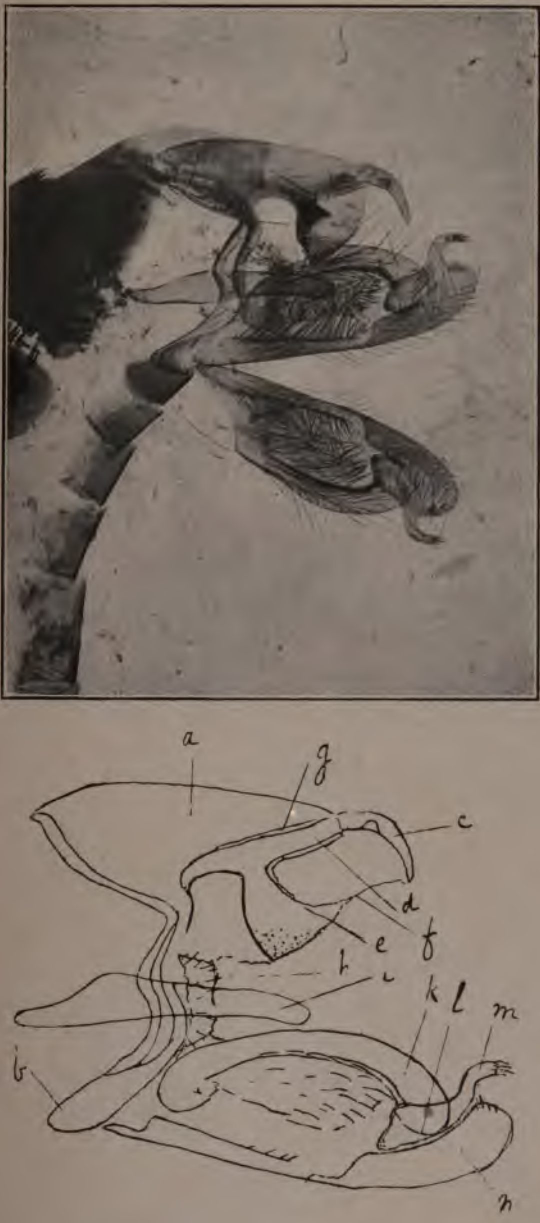

Photo. F. N. Clark.

HESPERIA CARTHAMI. MALE APPENDAGE × 15.

DIAGRAM OF SAME.

there may be various considerations to the contrary. If the appendages are least specialised, so, one would expect the other characters of the species to have a more primitive aspect. It is difficult to say whether this is so or not, nor does the geographical distribution give much assistance in arriving at a conclusion. The most definite ground for regarding this form as more primitive is the structure of the ventral plate of the 10th abdominal segment. This plate used to be called the "scaphium," but as that structure is dorsal to the anus (and present in comparative few families), it is obviously distinct from the 10th abdominal sternite. It is this 10th abdominal sternite that assumes a peculiar articulated structure in some groups, to which in those groups the name "gnathus" seems appropriate.

In the Hesperias this plate is solidly soldered to the dorsal portion of the segment. In *carthami* it is a simple plate (armed with rough points) forming, with the dorsal portion of the segment, a ring.

This structure is much the same in the *cacaliae* section of the genus, in which also the clasps retain much of the same outlines as in *carthami*. In the *alveus* section each side developes a specially formed process, and the middle portion is unchitinised, and the valves retaining very similar structure, develope considerable enlargement of the end of the valve (ventral) portion of the clasp. In the *onopordi* and *malvae* section there is more elaboration of these side portions of the 10th sternite, and the clasps are slightly modified. The five further natural groups defined by Dr. Reverdin differ a good deal from the three already referred to, in the development of the clasps. These five groups, all more or less Eastern or Southern, except perhaps that of *sao*, seem more nearly related together than to three more European groups (*cacaliae*, *alveus*, *malvae*), or four if we keep the *carthami* group separate from that of *cacaliae*.

To return, however, to the morphology. In the plate (Pl. vi.) is a photograph of the appendages of *Hesperia carthami*, and a diagram of them for reference.

a. The Tegmen (tergite); *b*. The Saccus (sternite), with the connecting lines of chitin form the ring of the 9th abdominal segment; *c*. The Uncus; *d*. The connecting portion; and *e*. the 10th sternite, forming together the ring of the 10th abdominal segment.

This 10th sternite had better be called simply the 10th sternite. Dr. Reverdin has some remarks on it in the second volume of the *Bulletin of the Geneva Society*, p. 143, in which he recognises that it is not the "scaphium," and objects to calling it "gnathus," a name proposed for it, only when articulated and moveable as in Scoparias, some Geometers, etc. The term he proposes, "lateral apophyses of the uncus," is not applicable to it in *carthami*, the uncus being the tergite and this the sternite. It seems more correct in the *alveus* group, where one *might* contend that the apophyses were dorsal. But the homology of these apophyses in *alveus*, etc., with the 10th sternite in *carthami*, *cacaliae*, etc., is too obvious to permit of this. They might probably quite correctly be called "lateral apophyses of the 10th segment," or "of the 10th sternite."

In writing 10th segment one means of course 10th abdominal. They are obviously not the sternite itself but processes of it. Though Dr. Reverdin proposes the name of "lateral apophyses of the uncus," he finishes the note in which he does so by saying that he adopts the term "lateral apophyses" to which conclusion no objection can be taken. In *carthami*, etc., there are of course no lateral apophyses.

f. Refers to the membranous floor of the genital cavity, or that portion of it closing the 10th segment, extending from the 10th sternite to the tip of the uncus (tergite). This membrane is frequently lost in preparing the specimen, but in a considerable number it is more or less preserved. This portion is pierced by the anus (not shown in diagram), it would be near the point marked by *f*. The rest of the floor of the genital cavity extends from the posterior margin of the 10th sternite to the bases of the clasps (and of course laterally to the ring of the 9th segment), it is pierced by the aedeagus, *i*, and is membranous for the most part, but has in many species, as in *Hesperia*, a circle of chitinous material, *h*, surrounding the exit of the aedeagus, which may best be called the penis-sheath, a name to which it is probably entitled by priority.

In the diagram is a suture marked *g*, quite evident also in the photograph (if successfully reproduced), and to be made out in preparations of many species of *Hesperia*, this is the suture between the 9th and 10th segments.

It will be noted that it marks off from the tegmen a portion that is not 9th but 10th segment, and that the dorsal portion of the 10th segment is not merely the uncus, but also a portion of what we have been used to accepting as the solid indivisible 9th tergite. At its anterior termination it may be regarded as opening out into the membranous intersegmental membrane (floor of genital cavity) uniting (or separating) the 9th and 10th segments laterally and ventrally. The claspers are rather complicated organs, but are divisible, as is very usual, into a lower (ventral) section, the valve *n*, and an upper (or more dorsal) section, the harpe, *k*, *l*, *m*. The clasp is a combination of two apophyses of the ventral aspect of the 9th segment, which it is desirable to distinguish by separate names, and for these "valve" and "harpe" seem available, and to hold priority, though much confusion has arisen from ignoring the term "harpe" and using the terms "valve" and "clasp" synonymously. In some groups, as in Pierids, the valve is well developed, but it is difficult to say that the harpe is discoverable, in such a case the terms valve and clasp are practically synonymous.

In *Hesperia* the harpe is rather elaborate, it consists of a basal portion, *k*, which at the line *l* folds over (or appears to) and forms what looks like another separate piece, this again terminates in a further process, *m*, called by Rambur the style, which differs considerably in different species. Dr. Reverdin appears to extend the term style to include the whole plate that looks like a separate piece, but is attached to the basal portion, *k*, at the line *l*. He uses the term "cuiller" (spoon) for the terminal portion of the valve, indicated in the diagram by *n*, which has in many species a very spoon-like aspect.

(*To be continued.*)

Records of some New British Plant-Galls. VI. Ninety-nine New British Gall-mites (Eriophyidæ).

By RICHARD S. BAGNALL, F.L.S., F.E.S., and J. W. H. HARRISON, M.Sc.

(*Continued from page 15.*)

The *Eriophyidae*, or gall-mites, are mostly gall-causers or inquilines of mite-galls. The creatures themselves are very small, some being so minute as to take more than one million (1,000,000) to cover a piece of paper two inches square. It is one of many groups that may be classed as "neglected" by British naturalists, though many mite-galls are well enough known. At the beginning of 1916 fewer than 70 forms of *Eriophyidae* were known (so far as we can gather) to British naturalists, and these were known almost entirely by their galls. Without pretending in any way to have made a special study of the subject we have records of 174 British species and varieties, 35 of which are as yet unnamed, and 150 of which are dwellers in our northern counties. Our list of mite-galls caused by the 174 forms numbers 230.

To any naturalist wishing to study the mites themselves it will be recognised that there is a rich field for research.

Family. ERIOPHYIDÆ.

Subfamily. ERIOPHYINÆ.

1. *Eriophyes pteridis*, Moll.

On bracken. Houard, 66.

Records from NORTHUMBERLAND, DURHAM, CUMBERLAND, LANCASHIRE, and CHESHIRE.

2. *E. pini* var. *floricola*, Nal.

On silver fir. Houard, 112.

DURHAM, Eastgate in Weardale, R.S.B.

3. *Eriophyes quadrisetus*, Thomas, and

4. *E. quadrisetus* var. *juniperina*, Nal.

On juniper. Houard, 123, 124.

LANCASHIRE and WESTMORLAND, in the neighbourhood of Grange-over-Sands, R.S.B.

5. *Eriophyes tenuis*, Nal. Houard, 288, 257.

DURHAM, Penshaw district, on *Bromus sterilis*, R.S.B., and Wolviston, on *Dactylis glomerata*, J.W.H.H.

6. *Eriophyes populi*, Nal.

On white poplar. Houard, 472.

LANCASHIRE, Ainsdale and Freshfield, R.S.B.

7. *Eriophyes varius*, Nal.

On aspen. Houard, 515.

Records from NORTHUMBERLAND, DURHAM, and YORKSHIRE.

8. *Eriophyes triradiatus*, Nal.

On *Salix repens*, rosette of leaves. Houard, S. 13.

LANCASHIRE, near Ainsdale, R.S.B.

9. *Eriophyes effusus*, Can.

On *Salix caprea*. Underside of leaf with a depression furnished with an *Erineum*, as described in Houard, S. 58, from *Salix daphnoides*..

NORTHUMBERLAND, Minsteracres, Riding, Mill-on-Tyne.

10. *Eriophyes gemmarum*, Nal.

On *Salix aurita*. A largish "bud" gall with abnormal pilosity. Houard, 830.

DURHAM, Derwent Valley, near Hamsterley, R.S.B.

11. *Eriophyes atrichus*, Nal.

On *Stellaria graminea* and *S. holostea* (once). Houard 2321 and 6637.

Records from DURHAM, CUMBERLAND, and LANCASHIRE, R.S.B.

12. *Eriophyes filiformis*, Nal. Houard, 2046, 2065.

CUMBERLAND, on common elm, Keswick, R.S.B.

NORTHUMBERLAND. Pustules on leaves of wych elm, *probably* referable to this species; common near Allendale, R.S.B.

13. *Eriophyes cerastii*, Nal.

On *Cerastium vulgatum*. Houard, 2337.

CUMBERLAND. A badly attacked patch of plants, Alston, R.S.B.

14. *Eriophyes vitalbae*, Can.

On *Clematis vitalba*, deformation of terminal leaves. Houard, 2413.

LANCASHIRE, Yewbarrow Crags, Grange-over-Sands, R.S.B.

15. *Eriophyes malpighianus*, Can. et. Mass.

On *Laurus nobilis*, strong hypertrophy of flowers and organs with covering of yellowish hairs. Houard, 2469 (figs. 703-704).

LANCASHIRE, Grange-over-Sands, on two bushes, R.S.B.

16. *Eriophyes destructor*, Nal.

On *Sedum acre*. Houard, 2756.

Records from CUMBERLAND, WESTMORLAND, LANCASHIRE, and YORKSHIRE.

17. *Eriophyes calycobius*, Nal.

Bud-gall on hawthorn. Houard, 2943.

Records from NORTHUMBERLAND, DURHAM, CUMBERLAND, and LANCASHIRE, R.S.B.

18. *Eriophyes albaespinae*, Cotte.

An obscure gall on hawthorn leaves, at angles of midrib and nervures. Houard (supplement), 6757.

DURHAM, between Hylton and Sunderland, rare; R.S.B.

19. *Eriophyes gracilis*, Nal.

On leaves of dewberry and raspberry. Houard, 2967, 3026.

Records from DURHAM, LANCASHIRE, CUMBERLAND, and WESTMORLAND, R.S.B.

20. *Eriophyes nudus*, Nal.

On Wood Avens. Houard, 3088.

DURHAM, in a lane near Lanchester; plants very badly attacked, R.S.B.

YORKSHIRE, between Nunthorpe and Ornesby, J.W.H.H.

21. *Eriophyes phlococoptes*, Nal.

Hypertrophy of the bark, cultivated plum. Houard, 3271.

DURHAM, Gibside, R.S.B.

22. *Eriophyes paderineus*, Nal. (*E. padi* in part.)

On bird cherry (*Prunus padus*). Houard (*E. padi*), 3314.

Records from NORTHUMBERLAND, DURHAM, and CUMBERLAND.

23. *Eriophyes genistae*, Nal.

On Broom and Gorse. Houard, 3419, 3398.

Records from NORTHUMBERLAND, DURHAM, and LANCASHIRE.

24. *Eriophyes ononidis*, Can.

On Rest-harrow. Houard, 3499.

DURHAM, between Horden and Blackhalls, J.W.H.H.

LANCASHIRE, Birkdale Sandhills, near Southport, R.S.B.

25. *Eriophyes plicator*, Nal.

On Black Medick. Houard, 3808.

DURHAM, Penshaw Hill, R.S.B., and locality not noted, J.W.H.H.

26. *E. plicator* var. *trifolii*, Nal.

On clovers. Houard, 3588.

Records from DURHAM, LANCASHIRE, and CUMBERLAND.

27. *Eriophyes euaspis*, Nal.

On Bird's-foot Trefoils. Houard, 3615, 3620, and 3629.

Records from NORTHUMBERLAND, DURHAM, CUMBERLAND, WESTMORLAND, YORKSHIRE, and LANCASHIRE, on *Lotus corniculatus*. Rare on *L. major*.

28. *Eriophyes geranii*, Can. Houard, 3801.

29. *E. dolichosoma*, Can. Houard, 3802.

On *Geranium sanguineum*.

NORTHUMBERLAND, Warkworth, H. Jeffreys.

DURHAM, Horden and Blackhall Rocks, J.W.H.H.

30. *Eriophyes schlechtendalii*, Nal.

On *Erodium cicutarium*. Houard, 3825.

NORTHUMBERLAND coast, rare, Budle Bay, J.W.H.H.

LANCASHIRE, coast near Freshfield, one patch of plants only, R.S.B

31. *Eriophyes oxalidis*, Trotter.

On Wood-Sorrel. Houard, 3832.

DURHAM. Rare, Gibside, R.S.B., and Birtley, J.W.H.H.

32. *Eriophyes empetri*, Lindr.

On Crowberry. Houard, 3906.

Durham, Waldridge, J.W.H.H., Waskerley, R.S.B.
Yorkshire, common in N. Yorks, J.W.H.H.

33. *Eriophyes convolvens*, Nal.

On Spindle-tree. Houard, 3960.
Lancashire, abundant in the Grange-over-Sands neighbourhood.

34. *E. macrochelus* var. *pseudoplatani*, Corti.

On Sycamore, probably not uncommon. Houard (Eriophyid), 977.
Northumberland, Ninebanks, J.W.H.H.
Durham, Gibside, and Lancashire, Grange-over-Sands, R.S.B.

35. *Eriophyes hippocastani*, Fock.

On Horse Chestnut, apparently very rare. Houard, 4049.
Northumberland, near Staward, and
Lancashire, Grange-over-Sands, R.S.B.

36. *Eriophyes annulatus*, Nal.

On Buckthorn. Houard, 4071.
Lancashire, Grange-over-Sands, R.S.B.

37. *E. tiliae* var. *liosoma*, Nal.

On lime. Houard, 4146, 4158.
Apparently general in the North of England, including both forms escribed by Houard in his nos. 4128 and 4129.

38. *Eriophyes rosalia*, Nal.

On Rock-rose.
Lancashire and Westmorland, Meathop Fell and Grange-over-ands, rare, R.S.B., and Durham, Deneholme, and very sparingly in pper Teesdale, J.W.H.H.

39. *Eriophyes violae*, Nal.

On Heartsease. Houard, 4294.
Records from Northumberland, Durham, and Cumberland.

40. *Eriophyes peucadeni*, Can.

On Burnet Saxifrage. Houard, 4447, 4449.
Durham, Penshaw Hill, affecting both flower and leaves, rare, S.B.

41. *Eriophyes laccinatus*, Nal.

On Money-wort. Houard, 4617.
Durham, Gibside, R.S.B.

42. *Eriophyes fraxinicola*, Nal.

On Ash. Houard, 4638.
Northumberland, Stamfordham, August 29th, 1914, R.S.B.

43. *Eriophyes kerneri*, Nal.

On *Gentiana amarella*. Although taken on many species of Gentian n the Continent, this is the first record from *G. amarella*.
Northumberland. Taken by the Rev. J. E. Hull at Ninebanks, W.H.H.

44. *Eriophyes eutrichus*, Nal.

On small Bugloss. Houard, 4734.
LANCASHIRE, near Ainsdale, R.S.B.

45. *Eriophyes solidus*, Nal.

On *Stachys silvatica*. Continental records are from Betony.
NORTHUMBERLAND, near Stamfordham, R.S.B.
DURHAM, Penshaw, once; Hylton, R.S.B.; S.E. Durham, J.W.H.H.

46. *Eriophyes minor*, Nal.

On Thyme, rare. Houard, 4919.
CUMBERLAND, Alston.
WESTMORLAND, Meathop Fell.
LANCASHIRE, Grange-over-Sands, R.S.B.

47. *Eriophyes euphrasiae*, Nal.

On Eye-bright. Houard, 5120.
Local but generally distributed. Records from NORTHUMBERLAND, DURHAM, WESTMORLAND, CUMBERLAND, LANCASHIRE, and YORKSHIRE.

48. *Eriophyes xylostei*, Can.

On Honeysuckle (*L. periclymenum*). Houard, 5391.
CUMBERLAND, Keswick.
CHESHIRE, Bidston Hill, R.S.B. On a Japanese Honeysuckle (*Lonicera japonica*).
LANCASHIRE, Grange-over-Sands, R.S.B.

49. *Eriophyes schmardae*, Nal.

On Harebell. Houard, 5512.
DURHAM, Penshaw Hill, September, R.S.B.

50. *Eriophyes campanulae*, Lindr.

On Harebell. Houard (Eriophyid), 5516.
Recorded in Houard from the British Isles.

51. *Eriophyes tuberculatus*, Nal.

On Tansy. Houard, 5756.
DURHAM. On the Wear banks, between Chester-le-street and Hylton, especially common near Penshaw, R.S.B., Birtley and Lamesley, J.W.H.H.

52. *Eriophyes tenuirostris*, Nal.

Wormwood. Houard, 5768.
NORTHUMBERLAND, Budle, and DURHAM, Birtley, J.W.H.H.

53. *Eriophyes artemisiae*, Can.

Mugwort. Houard, 5823.
DURHAM. Abundant, Penshaw, Washington, Cox Green, Hylton, R.S.B., and Norton, J.W.H.H.

54. *Eriophyes marginem-volvens*, Corti (= *E. artemisiae* var. *subtilis*), Nal.

Mugwort. Houard (*E. a.* var. *subtilis*), 5820.
DURHAM, Fencehouses and Penshaw district, R.S.B., and Norton, J.W.H.H.

55. *Eriophyes liproctus*, Nal.

Ragwort. Houard, 5867.
DURHAM, Penshaw, R.S.B.

56. *Eriophyes anthocoptes*, Nal.

Creeping Thistle. Houard, 5926.
DURHAM, banks of the Wear at Penshaw and Hylton, probably not uncommon, R.S.B.

57. *Eriophyes hypochoerinus*, Nal.

On Cat's-ear. Houard, 6038.
DURHAM, Greatham, J.W.H.H., Penshaw, R.S.B.
CUMBERLAND, Alston, and LANCASHIRE, Birkdale, R.S.B.

58. *Eriophyes leontodontis*, Lindr.

Autumnal Hawkweed. Houard, 6059.
DURHAM, Penshaw, rare, R.S.B.

59. *Eriophyes pilosellae*, Nal.

Mouse-ear Hawkbit. Houard, 6202.
Several records from NORTHUMBERLAND, DURHAM, CUMBERLAND, WESTMORLAND, and LANCASHIRE.

Brenthis pales, its history and its named forms.

By Hy. J. TURNER, F.E.S.

(*Continued from vol. xxviii., p. 165.*)

In 1881 Alphéraky, *Hor. Ross.*, vol. xvi., p. 409 (Lep. Kouldjà Mts.), gave notes on *pales* var. *graeca*, Stgr.

"♂ and ♀ alæ subtus pallidiores; supra ♂ aurantiaco-fulvus, punctulis fuscis parvis; ♀ obscurior vel virescens. Ciliis plus minusve albidis, fusco alternatis."

"If, on the upper side, *pales*, which we find everywhere in Tian-Chian, once we have passed 8000ft. approaches var. *isis*, Hüb., they belong to the var. *graeca*, Stgr., by their underside being much more pale, as well as by the fringe being generally whitish or even white, alternating with black.

"Since these last characters are, in my opinion, more important than are the characters by which the *pales* of Tian-Chian approach var. *isis*, I place them here as those of var. *graeca*, Stgr.

"The males are often of a yellow orange and have the black dots very small, sometimes scarcely indicated.

"On the other hand I have a ♂ in which the forewings are almost completely covered by the black.

"The females vary enormously in the colour of the upperside, and often present charming aberrations. (I believe I took one specimen at 13,000ft. altitude.)" See below Staudinger, Cat. 1901.

Kirby in 1882 in his *Eur. Butt. and Moths*, p. 19, accepted the two main forms as one species *pales*. He says that the typical form is confined in S. Europe to the Alpine mountains, but is found in the plains of northern Europe and Asia, while the *arsilache* form is found at a lower elevation in Germany, Switzerland, N. Europe and N. and W. Asia.

Spangberg*, in 1882, *Ent. Tidskrift*, p. 129, described a form from Lapland and called it *inducta*. [I have not been able to get the original description of this form.] Rühl in 1895 thus described it, "Forewing upperside blue-violet, very strongly darkened, almost unicolorous black; only close to the apex of the wing furnished with a small red-yellow spot. On the hindwings the whole inner half is almost black, while in the outer half there are two rows of red-yellow spots. Tetrisuo near Perikkala, Karelia (Finland mid-July), Lapland, Ingermanland." This appears to be a form similar to the melanic aberration which occurs sporadically in some parts of the Alps. If this be a constant form in the Arctic area it would appear that what is a melanic aberration in the Alps is a local race in the Lapland marshes.

Moore, *Proc. Zool. Soc. Lond.*, p. 242 (1882), plt. xi., figs. 1 and 1a., describes a form of *pales*, as *baralacha*, n. sp.

"Upper-side fulvous; lower basal area of both wings minutely black-speckled; forewing with a black recurved streak within the cell, a lunular streak at its end; a discal transverse zigzag series of broader streaks, two outer rows of small spots, which are indistinct at the apex, and a marginal, indistinct, dentated lunular speckled line; hindwing with two less distinct and more slender cell-streaks, discal row of spots, two outer rows of spots (of which the inner row is indistinct), and a marginal speckled line.

"Underside :—Forewings paler fulvous, with the cell, discal, and inner rows of black spots as above showing very indistinctly; the costal border, two streaks from the apex, and short X-shaped marginal marks being yellow; hindwing yellow, with a very irregular transverse sub-basal, discal, and marginal fulvous red band; the sub-basal band bordered outwardly by linear pearly streaks, the discal band by indistinct pearly lunules, and the marginal band traversed by pearly X-shaped marks; the discal and marginal bands more or less confluent; a small pearly spot also within the cell."

The figure is a very good one, which gives a likeness to the *sipora* form on the upper side ♂. In fact it appears to be merely a mutation of the *sipora* form and not worth a distinctive name. Staudinger places the name as a synonym of *sipora* and remarks on it as similar to (but mis-spells it "*barachla*") both *caucasica* and *sifanica*. (*Cat.*, ed. iii., p. 35, 1901.)

Lang in 1884, *Rhop. Eur.*, vol. i., p. 109, cut out *isis* as under *napaea*. His figures are good. He gave one of var. *lapponica* underside, which shows a great and sudden contrast between the red and the white coloration. I should certainly say, as Mr. Wheeler states in his *Butt. of Switz.*, p. 80, that *napaea* is an ab. of *isis* ♀ "supra virescens."

In 1885 Kane, on p. 79 of his *Eur. Butt.*, gave a summary of what is known of *pales* and included *arsilache* as a variety.

Of var. *arsilache*, E., he noted "Wings rounder than in *pales*, and of a bright rusty-red, *with basal half of wings much charged with large black markings* so approaching some forms of *euphrosyne*. Underside forewings as in *euphrosyne*, *with large black spots and markings*. Underside hindwing like type, but variable."

Of var. *isis*, Hb., he says, "With squarer wings, and ♂ of paler washed-out colour above, much suffused with black, shot with violet at base and outer margin. Underside yellower."

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* Staudinger says "Spangberg," Rühl says "Sandberg."

Of var. ♀ *napaea*, Hb., he says, "A ♀ form of pale greenish colour shaded black as in ♀ type, but underside with apex of forewing greenish straw colour, as also hindwing, from which all silvery traces have disappeared, and also the anti-marginal series of spots."

Of var. *caucasica*, Stgr., he says, "Of uniform fulvous above and paler beneath."

Staudinger in 1886, *Stett. e. Zeit.*, p. 235, described a variety, which he named *generator*, from Central Asia, and which he obtained in numbers from the Alai, Tianschan, Ala Tau, etc., and differing from both the European and the Altai form, such as to merit a distinctive name.

The following are his remarks on this form:—"Since I consider that these are the stem-form of all other *pales* varieties, I call it *generator*. But the *generator* males are particularly more vividly brown-red and less black marked. The females also are paler, with less black, and only rarely show the green-gray colouring of the aberration *napaea*, Hb., and then only on the forewings. They are also marked with whitish marginal spots on the forewings, which for the most part only exist at the inner angle. The underside in the male is brown-red and yellow mixed, as is usual in *pales*. I sent out these specimens as var. *isis*, although I recognised they were not exactly that form. *Isis*, Hb., ♂ on the upperside is an ordinarily, strongly black marked *pales*, whose forewings on the underside are pronouncedly yellow. Probably there is an approach to a casual, similarly yellow aberration below, which I formerly obtained singly from the Alps, although never so yellow. The *pales* from the Altai and Tarbagatai are ordinarily as yellow below and since they are also tolerably strongly marked with black above, can be also taken to represent var. *isis*. The *isis* ♀ of Hübner, described much later, is an ordinary *pales*, large and somewhat dark; it might also pass in a general way for that of var. *generator*."

In his *Cat.*, 1901, Staudinger put the *graeca* of Alphéraky *Hor. Ross.*, 1881, p. 409, as a synonym of his form *generator*. In fact as soon as Staudinger obtained sufficient material of the form Alphéraky had considered in 1881 as his (Staudinger's) form *graeca*, he saw that it was distinct and immediately named it.

Calberla, *Iris*, vol. i., p. 133, (1887) "Die Macro. rom. Campagna," said of *pales*, "Abruzzi in July, not common. It flies on an alp at 1500 metres and is of a very small form; 30-35mm. The male on the underside of the hindwing strongly rust-red and yellow spotted, slightly powdered greenish at the base. The female with not much darkened upperside, the marginal spot of the hindwing on the upperside markedly bright yellow, on the underside the apex of the forewings and the whole hindwings yellow, less mixed with rust-red than the ♂. Var. *isis*, Hb.? In the Abruzzi."

In 1889 Teich recorded *Arb. Nat. Forsch. Ver.*, Riga, p. 7, *arsilache* as occurring near Riga. This would probably be at a low level.

In 1891 Grum-Grshimailo, *Hor. Ent. Ross.*, vol. xxv., p. 456, described a new form of *Brenthis pales* from Central Asia as var. *sifanica*.

"Luteis alis pallidioribus, anticis maculis nigris distinctissimis, posticis magis versicoloribus." In the mountains of Sinin-Schan and Dshachar.

Staudinger considered this very like *caucasica*, generally smaller, but quite distinct from its locality.

Rühl gives Thibet as a further locality (p. 796).

(*To be continued.*)

Lepidopterology.[*]

By T. A. CHAPMAN, M.D., F.E.S.

This volume continues the Lepidopterous Fauna of Barbary, and contains *Arctiidae*, *Lithosiidae*, *Nolidae*, *Cymbidae*, *Hepialidae*, and *Conidae*, and contains plates of *Sphingidae* and *Bombycidae* treated in Facs. xii. Seven species in the list occur in Britain. The text runs to 84 pages, with 22 plates, including two of interesting forms of *C. nicaea*, one of *Orgyia dubia* (with var. *splendida*), one of *O. trigotephras*, five of *Lasiocampa trifolii*, with many remarkable races and varieties. A few Thibetan *Drepanidae* take half a plate. Three plates of the species of *Somabrachys*, and two of *Procris*. Two plates of *Lycaena arion* and its allies, European and other, two plates of Arctiids, Lithosiids, etc., include a short series of *P. fuliginosa*, of which one, a Tunisian form (*fuliginosa-kroumira*, Obth.) has a breadth of wing almost suggesting that it belongs to another genus.

The second portion of the Fascicule is Professor Huelbert's Diagnoses of New Castnias, with rectifications of names incorrectly used. It consists of 36 pp. with six figures in five photographic (black and white) plates of new species. M. Culot's work maintains its admirable execution.

NOTES ON COLLECTING, Etc.

Euvanessa polychloros in London.—As an interesting incident in London entomology you may care to record that I caught a *E. polychloros* on the dining-room window of this house this morning.—G. C. Turner, 49, Cleveland Square, W. 2. *May 2nd*, 1917.

Psychides.—I should like to call attention to two points in Mr. Burrow's communication in the *Record*, vol. xxix., p. 69. Mr. Burrows has overlooked the fact that I showed that *opacella*, H.-S., is *atra*, L., in a note in the *Record*, vol. xiv., p. 57. That certain specimens should be deposited at South Kensington was hardly a stipulation of mine, except in so far that I expressed to Mr. Burrows my opinion that his collection of preparations of genitalia would find there their proper resting place.—T. A. Chapman, Betula, Reigate.

Correction.—In my plate figures 17 and 18 are wrongly described as cases of *Luffia lapidella*. Mr. Whittle tells me that they were misidentified and are really those of *L. ferschaultella*.—C. R. N. Burrows.

Notes on Lepidoptera in North Yorks, etc., in 1916.—I had very little opportunity for doing much entomological work in the past season owing to engagements of much more importance in the serious times we are passing through, but if time had been available the prospect of success was not very promising up in this district owing to the persistently cold and sunless weather that prevailed throughout the season, the most noticeable feature being the very late appearance of many of the species. The first species noted, *Tinea pallescentella*, was taken about some munition works in May, and later they were noticed coming out of joints of some boarding that had been filled up with dust in which the larvæ had probably fed up and pupated. A visit to the locality for which I have previously recorded *Stigmonota dorsana* (in (*Ent. Record*) on May 20th, found a few freshly out and flying between 4.30 and 6 p.m. (new time). Out of about two dozen specimens taken there were four aberrations, all males.

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[*] *Études de Lépidoptérologie Comparée*, Fasc., xiii.

1. Right wing with dorsal blotch much smaller than usual and divided into two parts. Left wing with only a small white dot in place of dorsal blotch.

2. Dorsal blotches very much reduced and not touching hind margin.

3. Right wing dorsal blotch small divided into two parts, the lower part simply a dot on the hind margin. Left wing dorsal blotch much reduced in size and not touching hind margin.

4. Right wing dorsal blotch much reduced in both width and length. Left wing dorsal blotch divided into two dots, lower one on hind margin.

Only one female was taken. Other species noticed on this date were *Clepsis rusticana* fairly freely, *Phoxopteryx lundana*, *Elachista rufocinerea*, and a worn specimen of *Peronea ferrugana* beaten out of oak.

Coccyx strobilella was bred fairly freely from some spruce cones on and about May 21st, also during the month *Lithocolletis nicellii* from hazel and *L. frölichiella* from alder. On the 26th a specimen of *Gelechia aethiops* was taken on the moors and *Cnephasia politana*, *Anticlea derivata*, and a few *Lithocolletis faginella*, the latter about beech.

On July 15th, *Zanclognatha grisealis*, *Argyrotoxa conwayana*, *Stigmonota coniferana* among firs, were taken on the moors, where *Argyresthia atmoriella* and *Coleophora laricella* occurred fairly freely. A few *Hydrocampa stagnalis*, including two specimens of a pale form, and *H. nymphaealis* were taken about some ponds on the same date. Noticing a male *Nemeophila plantaginis* suddenly stop its wild flight on the moors in the late afternoon of the 22nd, I investigated the place and found that it had located a partner and immediately copulated. *Argyresthia dilectella* occurred freely about some Juniper bushes in the garden about the end of the month. Other species noticed about the same time were *Eubulea crocealis* evidently feeding on the garden *Inula glandulosa*, *Argyrolepia badiana*, *Spilonota roborana*, *Sciaphila pascuana*, *Dictyopteryx forskaleana*, *Batodes angustiorana* flying freely in the early evening about Yews. In another locality within a mile of the garden *Cerotophora rufescens*, *Elachista cerusella*, *E. biatomae* and *Oposteya salicella* occurred. *Dichrorampha petiverella* was met with fairly freely in a locality in South Durham on August 3rd, about *Achillea millefolium*, some being *in cop.* about 6 p.m. (the time I have frequently noticed *D. herbosana*). Other species noticed in this locality were *D. herbosana*, *Eupoecilia vectisana* and *Elachista argentella* (*cygnipennella*). On August 9th, *Coccyx nanana* was flying freely about some fancy spruce in the garden in early evening, a species hardly expected in a town garden, I had previously taken it among spruce firs in a moorland locality at a much higher level (about 700 ft.) and usually getting well worn in the early part of July. *Grapholitha ramella* was seen about birch, with *Laverna atra* and *Argyresthia semifusca*.

On August 13th, *Grapholitha cinerana* occurred fairly freely in beautiful condition, ♂ s and ♀ s sitting about on aspens, the grey and black markings making them very difficult to see on the lichen covered trunks. *Olindia ulmana*, *Sciaphila sinuana* and *Mixodia ratzburghiana* also noted in the same locality, the latter a single specimen flying about spruce fir and interesting in apparently being only the second record for this species for Yorks.

On the Durham coast on September 2nd, I met with *Peronea aspersana*, *P. variegana* and *P. schalleriana*, *Ephippiphora semifuscana* worn, *Spilonota incarnatana* getting worn, *D. forskaleana* and some belated specimens of *Aricia astrarche* (var. *salmacis*).—T. Ashton Lofthouse, F.E.S., Middlesbrough.

Ephyra pendularia ab. decoraria (subroseata).—Mr. Turner's note in the March number of the *Entom. Record* gave me the first information I have received of the pre-naming, as ab. *decoraria* of the form of *Ephyra pendularia* which I described, and to which, in my ignorance of its having been previously described and named, I gave the name ab. *subroseata*. Until that note appeared I had not seen the volume of Seitz in which Mr. Prout's description of *E. pendularia* occurs—I had seen Mr. Barrett's figure of the specimen in Mr. S. Webb's collection, and wrote to Mr. Barrett for fuller information about that specimen. He replied that he could give me none, and I therefore concluded that it had been neither previously described nor named. The form is not uncommon in certain woods in N. Staffordshire, and I described the aberration from specimens taken by myself in that district. I apologise to Entomologists for having overlooked the record in the *Zoologist*, vol. xix, p. 7798 (1861), a record made when I was a schoolboy, which I think only Mr. Prout's indefatigable energy could have rediscovered. —F. C. Woodforde.

CURRENT NOTES AND SHORT NOTICES.

I have recently received a post-card from Father Schmitz in Holland, dated January 1st, 1917. On the front it is stamped—"Part of a mail captured by the Germans and delayed." In it he writes he is very happy to be able to see the *Entomologist's Record*, which he gets at La Bibliothique de la Société Neerland d' Entomologie.—H.D.

Last month we were very pleased to see our colleague Captain Burr once more, at home on leave for a few days. He was looking very well and in his usual good spirits. He brought back some ants for us, and other insects, reptiles, etc., from Salonika, for other friends. He has now returned to Salonika.—H.D.

The *Entomological News* for January contains among other matters (1) Notes on the Penes of Damselflies (Odonata) by C. H. Kennedy, dealing mainly with a number of species collected in Hawai by Dr. R. C. L. Perkins, and illustrated by two plates. (2) An account of the *Anopheles* of the Panama Zone for identification of the species. (3) An account of some insects unusual as being found associated with orchids, including a *Castnia*, several species of Coleoptera not hitherto recorded as such, and representatives of other orders There are two plates of illustrations.

The arrangements for the Annual Congress of the S. Eastern Union of Scientific Societies, which was to have taken place at Reading this year, have fallen through, owing to the inability of the local authorities to find suitable accommodation for the various activities of the meeting. It has now been finally decided to hold the Congress in London under the Presidency of Dr. Martin, who for some years has been the popular and very successful Hon. Secretary of the Union. The headquarters will be the rooms of the Linnean Society, which have been kindly lent for the purpose by the Council. We understand that a most interesting programme has already been arranged. Other Societies are lending their assistance, including the Zoological Society. We hope that all those who can be present will send in the small subscription asked, and thus help to make the meeting as successful in numbers and finance as it usually is in its main object, the spread of scientific knowledge.

In the *Ent. Mo. Mag.* for February Dr. R. C. L. Perkins in a critical examination of the Kirby collection of British Bees, describes a species of *Sphecodes* hitherto unrecorded from Britain, *viz.*, *Sphecodes scabricollis*.

A Separatum from the *Proceed. U.S. Nat. Mus.*, entitled "A Generic Synopsis of the Coccinellid Larvæ in the U.S. Nat. Mus., with a description of the larva of *Hyperaspis binotata*," by Adam Böving contains four admirable plates of detail structure.

The "Popular and Practical" feature of the *Can. Ent.* for February is devoted to an account of the Wolf Spider, a Lycosid. A plate gives a front face view of this ferocious looking spider, a truly "fearsome beastie." The writer was able easily to manipulate the subject for taking its portrait, for he took the specimen from a predacious wasp, who had captured and paralysed it with poison and was dragging it to her cell. Other items of interest in the *Can. Ent.* for February are (1) the first instalment of "Insects in Ocean Drift," by H. M. Parshley, in which the author records a large number of Hemiptera-Heteroptera met with by him in his summer holidays at Beach Bluff, Mass. (2) A most interesting series of "Observations on the Light-emission of American *Lampyridae*," by F. A. McDermott, supplementary to the four papers on the subject previously contributed. (3) A continuance of the Geometrid Notes by L. W. Swett, in which he deals with a portion of the genus *Dysstroma*, commencing with *Dysstroma citrata* (*truncata*), and its forms ab. *punctum-notata*, ab. *immanata*, ab. *simpliciata*, ab. *insolida*, ab. *rufibrunnea*, var. *brunneata*, etc., and shows that *mulleolata* is a true species and not a form of *citrata*.

The several parts of the *Ent. Tidskrift* for 1916 are exceptionally interesting to lepidopterists. Among other matters they contain (1), the completion of a long "Contribution to the knowledge of the Lepidopterous Fauna of the Kronoberg district," by Alb. Tullgren. This section deals with the Pyrales, Tortrices and Tinea. Most of our commoner British species seem to be found in this district of Southern Sweden. We wonder what the "*Tortrix wahlbomiana*" is. *Peronea cristana* is apparently wanting, and *Cydia* (*Carpocapsa*) *pomonella* is present. *Cossus ligniperda*, *Aegeria tipuliformis*, *Alucita* (*Orneodes*) *hexadactyla*, four species of the genus *Gelechia*, two of *Coleophora*, *C. fuscedinella* and *C. nigricella*, *Hyponomeuta padellus* and *H. cognatellus*, nine species of *Argyresthia*, only one *Lithocolletis*, *L. quercifoliella*, two *Adela* and two *Micropteryx*, etc., etc., are included; (2) A Bibliography of the Entomology of Sweden in 1910-1913; (3) Notes on Lepidoptera with figures of aberrations, and of the two or three terminal segments of the pupæ of numerous species showing the distinct sexual differences, a long article by David Ljungdahl; (4) Further contributions to a knowledge of the Lepidoptera of Kronoberg, by J. A. L. Brundin; (5) F. Nordström commences a long series of notes on the species of Swedish Lepidoptera which have come under his notice; (6) A. Roman gives a general account of the Amazon region of Brazil from an entomological point of view; (7) R. Malaise contributes notes on a few species of *Noctuae* and *Geometrae* which he met with around Stockholm; (8) Notes on aberrations of *Noctuae* and Geometers, by J. Meves; and (9) Notes on various water-Hemiptera, by O. Lundblad, with a detailed description and plate of the larva of *Velia currens*.

" A Contribution to our Knowledge of the White Flies of the Subfamily *Aleurodinae* (*Aleurodidae*)," by A. L. Quaintance and A. E Baker, in the Proceedings of the U.S. Nat. Mus., consists of 110 pages and 45 plates, with many text figures, and is an important paper on these curious little flies. The descriptions are of the "uncomparative" type as a rule, although the introduction to each genus contains an analytical key to the species it includes.

The *Irish Naturalist* for March contains an account of numerous species of Irish Ichneumons from the pen of the Rev. W. F. Johnson, M.A., who has worked at the entomology of Ireland so long and steadily in more than one Order.

P. J. Parrot, in the *Bull. N. York Ag. Exp. Station*, continues his 'Miscellaneous Notes on Injurious Insects." In conjunction with H. E. Hodgkiss he deals with—1. *Hyponomeuta malinellus* and *H. padellus*, which have been introduced in quantity from Europe; 2. The Leaf-weevil, *Anametia granulata*, which attacks the peach buds in many districts; 3. The Peach-borer, *Synanthedon pictipes*, a clearwing moth; 4. The winter moth, *Erannis tiliaria*; and 5. the gooseberry fruit-worm, *Zophodia grossulariae*, the larva of a species of saw-fly. There are good illustrations of the imagines, the larvæ and the depredations caused.

The *Ent. Mo. Mag.* for March contains a very good portrait of the late Chas. O. Waterhouse, the well known Assistant Keeper in the Entomological Department of the British Museum, S. Kensington.

In the *Entomological News* for March is the biography of Miss Emily Morton, of New Windsor, U.S.A., whose experiments in crossing various species of the *Saturniidae* were much noted a quarter of a century ago. We still have the specimens of the hybrids between *cecropia* and *gloveri*, *cecropia* and *ceanothi*, etc., sent us at that time. The same number contains a long contribution on the Giant Katydids (*Steirodontia*) of America, with one plate.

M. Mabille continues to describe new *Hesperiidae*. In the March *Bull. Soc. Ent. France*, in conjunction with M. Boullet, he introduces a considerable number of new species from Africa.

In the *Ent.* for March Mr. W. Mansbridge describes a new variation of *Aplecta nebulosa*, which he breeds in about 1 to 3 per cent. each year, as var. *plumbosa*. He states that it varies from leaden-grey to fuscous-grey in ground colour but is never black. The larvæ were on each occasion obtained from Delamere Forest.

The March number of the *Can. Ent.* contains an article entitled "Precipitation in Relation to Insect Prevalence and Distribution," in which attention is drawn to instances of how humidity in the form of rain or snow has been and is instrumental in either curtailing or aiding the spread of insects over the country, particularly in the Prairie Provinces. The writer concludes that snow plays an important part in the preservation of animal life and it also saves many a plant from destruction. Specifically the author's opinion is that, with regard to dreaded Colorado Potato Beetle, wherever the snowfall is light will never prove a prolific breeding ground for that insect and that normal conditions of heavy snow will afford protection to this economic pest.

A suggestion is made in the *Ent. News* as to the making of labels by photography. The label can be hand printed in indian-ink a number of times on a sheet of paper allowing the necessary spaces for the date and then photographed down to size. Of course the prints must be very thoroughly fixed.

Prof. Cockerell has recently described a Coccid from Costa Rica where it was discovered on twigs of *Vaccinium* growing at a height of 11,300 ft. on Mt. Irazu, probably "the hightest altitude yet known for a Coccid." (*Ent. News.*)

In the *Scottish Naturalist* for November Mr. Jas. W. Munro examines critically, from an economic point of view, the life-history of the Coleopteron *Hylastes cunicularius*. He sums up the results of his study. (1) That the beetle undoubtedly breeds in Scotland and may be common. (2) That it is a spruce-dweller, breeding below soil level. (3) That it feeds in the roots in which it was reared and is probably a formidable enemy of young trees planted in old spruce clearings on account of its migratory habits. (4) That it is harmless in the larva stage. The adult on the other hand injures or totally destroys newly planted conifers of various kinds by its attacks on the roots.

At times ants are a considerable domestic nuisance and many are the recommendations to control them, all of which are less rather than more efficacious. Arthur Gibson of Ottawa, in the November number of the *Canadian Ent.*, states that he has on several occasions found that dusting sodium fluoride in their haunts, runs, etc., has been perfectly successful.

We have recently received the following separata from the *Proceedings of the U.S. National Museum*:—"Report on Arachnida collected by Messrs. Currie, Caudell, and Dyar, in British Columbia," by N. Banks; "Some Diptera (Microdon) from Nests of Ants," by T. D. A. Cockerell and H. Andrews; Descriptions of Miscellaneous N. American Chalcidid Hymenoptera of the Family *Eulaphidae* (2 pts.)," by A. A. Girault; "New Genera and Species of Muscoid Flies," by C. H. T. Townsend; "New and little-known Heteropterous Hemiptera in the U.S. National Mus.," by E. Bergroth; and "Some American Fossil Insects," by T. D. A. Cockerell.

A little booklet has come to hand entitled "Royston Heath, its History, its Beauty, and its Typical Wild Flowers," new edition, published in 1898. In it we read the following, "A peculiar characteristic in the butterflies of the Heath is found in the large numbers, in most seasons, of the pretty little *Lycaenidae*, which comprehend those charming little Blues and Coppers, with their wonderful tint markings on the wings; but more especially the Blues, such as the beautiful little

Clifden Blue (*Polyommatus adonis*), and the larger *chalk-hill-blue*." Apparently Royston has been locally famed for its "Blues" for many years past, although entomological records of the amazing numbers and extreme aberrations are completely absent until quite recently.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

January 25*th*, 1917.—ANNUAL MEETING.—The Balance Sheet and Report of the Council were read and adopted. In the absence of alternative names the President declared the nominees elected to fill the several Offices and Council for the ensuing year. (See p. 18.)

ADDRESS.—The President then read his Address, "Shakspere and Insects." Votes of thanks were passed to the various Officers and Council for the past year.

February 8*th*.—NEW MEMBER.—The Rev. D. M. Darwell, of Dagpole, Woodeford Wells, was elected a member.

VARIATION IN BRITISH ZYGAENIDS.—Mr. A. W. Buckstone exhibited series of *Zygaena lonicerae*, *Z. trifolii*, and *Z. filipendulae*, from many British localities, and read a paper on the local racial characters shown and gave an analysis of the markings on the undersides. A short discussion ensued.

A CONIOPTERYX COCOON.—Mr. Hugh Main, the curious double cocoons spun by a species of *Coniopteryx*.

AFRICAN BOMBYCINE MOTHS.—Mr. H. Moore, various Bombycine Moths from Ashanti, including *Bunea alcinöe*, *Lobobunea phaedusa*, *Gynanisa ethra*, *Nudaurelia butleri*, *Imbrasia epimethea*, *Microgone herilla*, and *Carnegia mirabilis*.

ABERRATION OF A. MEGACEPHALA.—Mr. Bowman, a unicolorous slate coloured example of *Cuspidia* (*Acronicta*) *megacephala* from Hackney Downs.

February 22*nd*.—AN EXHIBITION OF LANTERN SLIDES.—Mr. West (Ashtead), slides showing androconial scales of several species of each of the families of butterflies represented in the British fauna.

Mr. Hugh Main, slides showing (1) ova of the Earwig *in situ* ; (2) a series of details of the life-history of small ground beetles from Epping Forest; (3) a series illustrative of the transformations of *Dytiscus marginalis*: (4) a series illustrative of habits of the larva of *Cicindela campestris*.

Mr. Dennis, series of slides illustrating the Wild Service Tree and the Robinia.

Mr. Bunnett, slides illustrating all stages of a colony of *Vanessa io*, and a few of the *Hydra* and *Volvox globator*.

March 8*th*.—DECEASE OF A MEMBER.—The death of Mr. A. E. Gibbs, Vice-president, was reported.

SURREY COLEOPTERA.—Mr. W. J. Ashdown exhibited examples of all the species of Surrey Coleoptera which he had taken during the season of 1916. Beetles were generally abundant throughout the year.

DRAWINGS.—Mr. Frohawk, drawings of very aberrant examples of the Hawfinch, the Chaffinch, and the Robin.

A PAPER.—Mr. Newman read a short paper, "The Rearing of *Macrothylacia rubi.*"

March 22*nd*.—A TEPHROSIA TWO YEARS IN PUPA, ETC.—Mr. A. Buckstone exhibited series of the March and July broods of *Tephrosia bistortata*, bred from an Oxshott female taken in April, 1914, including a female which had remained in pupa two winters from June, 1914, to February, 1916. He also showed *T. crepuscularia* taken in various Surrey localities during May for comparison. A discussion ensued.

EXOTIC LEPIDOPTERA.—Mr. Edwards, a box of Exotic Lepidoptera.

BRITISH PSYCHIDÆ AND LITHOCOLLETIS.—Mr. Turner, a photograph of the larval cases of the 15 more easily obtainable species of the British *Psychidae*, taken by the Rev. C. R. N. Burrows, who was desirous to obtain fresh specimens for structural examination. Mr. Turner also showed imagines of several of the commoner species of the genus *Lithocolletis*, and made some remarks on their life-history.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

February 19*th*, 1917.—BACKYARD INSECTS.—A discussion and exhibition of "Backyard Insects," to which most of the members contributed, was the feature of this meeting. The exhibits, mainly common species of Lepidoptera, were of such considerable interest, from the point of view of distribution, that it was decided to devote another evening to the same subject next session.

EXHIBIT OF DIPTERA.—Mr. West contributed the following Hymenoptera and Diptera from St. Helens :—*Chrysis ignata*, *C. rudii*, *Thereva nobilitata*, the silvertail fly, *Leptis scolopacea*, *L. lineola*, *Sarcophaga carnaria*, and several species of *Dolichopodidae*.

March 19*th*.—THE RARE TINEID B. GLABRATELLA.—Mr. F. N. Pierce exhibited *Blastotere glabratella*, Zell., an Argyresthiid moth belonging to the *illuminatella* group, captured near Repton, Derbyshire, by Mr. C. H. Hayward. The species was introduced to the British list by Lord Walsingham, in 1906, from specimens taken in Norfolk, and it has since been taken near Kings Lynn by Mr. Atmore ; the Derbyshire record therefore seems to indicate that it is spreading in Britain.

PSYCHIDAE.—Mr. Pierce also exhibited a series of drawings of the male genitalia of the Palæarctic *Psychidae*, executed by the Rev. C. R. N. Burrows from recent preparations made by himself ; the exhibit further included most of the British species with their cases.

MELANISM IN S. AMBIGUALIS.—Mr. W. Mansbridge showed a series of *Scoparia ambigualis* and its melanic variations, from the West Riding and East Lancashire.

April 16*th*.—NEW MEMBERS.—The following were elected members of the Society :—Mrs. M. Hughes, L.L.A., Wallasey, Cheshire ; Miss Rose Egerton, Seacombe, Cheshire ; and the Rev. F. M. B. Carr, Alvanley Vicarage, near Helsby, Cheshire.

PAPER.—Mr. Wm. Mansbridge read a paper describing the work and methods of the Lancashire and Cheshire Fauna Committee. In spite of the present handicap of circumstances due to the war, an immense amount of work has been done, especially in the less studied orders. The committee has been fortunate in enlisting the assistance of a large number of specialists in the different branches of natural science whose services are at the disposal of all fieldworkers for advice and identification of specimens. Already a large number of species have been added to the county lists, and a smaller but still satisfactory number have been described as new to science.

EXHIBITION AND NOTES ON SOME DOUBTFUL TORTRICES AND TINEA.—Mr. F. N. Pierce showed series of *Catoptria aemulana*, *C. tripoliana*, and from the late S. Steven's collection a series of reputed *C. decolorana*: also a specimen of *Eupoecilia manniana*, which, from an examination of the genitalia, he had found to be a dwarfed *Argyrolepia cnicana*. Mr. Pierce also gave some critical notes on *Ephestia elutella* and *E. passulella*. He was followed by Mr. W. Mansbridge, who exhibited the latter species in illustration of his remarks.

ABNORMAL FEMALES OF P. SIMILIS.—Mr. S. P. Doudney had a long series of *Porthesia similis* from wild larvæ taken on the same hedgerow at Huyton, near Liverpool, in which many of the females had tail-tufts brown instead of yellow, except for a slight admixture of yellow hairs; all the males were normal.

REVIEWS AND NOTICES OF BOOKS.

"THE ANTS OF THE BALTIC AMBER," by William Morton Wheeler, Ph.D., Professor of Economic Entomology, Harvard University. [Schrift. Phys-ökonom. Gesell. Königs, 55, 1-142, 66 Tfs. (1914)].

Through the kindness of Father Schmitz, of Sittard, Holland, I have been able to obtain a copy of my friend Professor Wheeler's remarkable work on the ants of the Baltic Amber. As the eminent author was unable to send out any reprints of his paper on account of the war, and as my copy is probably the only one in this country, or likely to be until after the war is over, it is perhaps desirable to review in some detail this most important contribution to the knowledge of fossil insects. I have also endeavoured to summarise most of Wheeler's masterly deductions and conclusions. This work is of especial interest to me, as I have recently made a preliminary examination of all the fossil ants in the British Museum from the Isle of Wight lime-stone, the age of this being the same, or perhaps a little later, than that of the Baltic Amber.

In 1868 Mayr published a very "thorough and comprehensive masterpiece" on the material at his disposal of the Baltic Amber ants—he studied 1461 specimens, describing 49 species, referable to 23 genera. Though many more specimens have been acquired, very little attention has been devoted to the amber ants since Mayr's paper. In 1875 Er. André added two species, and in 1905 Emery added one genus and species, bringing the list up to 24 genera and 52 species.

Wheeler has personally examined no less than 9527 amber ants, and he describes 21 new genera and 40 new species.

Taking into consideration a few necessary changes in the definition of genera according to modern ideas, the list now stands at 43 genera and 92 species, which belong to four out of the five subfamilies to which all ants are now assigned, as follows:—

Subfamily.	Genera.	Species.	Individuals.
Ponerinae ...	8 ...	10 ...	111
Myrmicinae ...	15 ...	30 ...	232

Dolichoderinae	7	20	7508
Camponotinae	13	32	3827

This is about the proportion of species in the different subfamilies one might expect from any tropical or subtropical region as large as that of the Baltic amber, though not of course of the individual representation. The much larger number of specimens in the *Dolichoderinae* and *Camponotinae* is chiefly accounted for by the presence in the former of 5428 individals of one species—*Iridomyrmex goepperti* Mayr, and 1289 of another—*I. geinitzi* Mayr; and in the latter, of 1310 individuals of *Formica flori* Mayr, and 1172 of *Lasius schiefferdeckeri* Mayr, Of course however the highly arboreal habits of these two subfamilies would render them more liable to be trapped in the liquid resin. The entire absence of some very tree-frequenting genera, such as *Cremastogaster* in the *Myrmicinae*, etc., can only be accounted for by the supposition that they never invaded the Baltic region, and not to the selective action of the resin, as they must certainly have existed as far back as the Lower Oligocene.

The fact that not a single member of the whole subfamily *Dorylinae* has been found in the amber can only be explained in the same way. They are nearly as primitive as the most primitive subfamily—the *Ponerinae*, and though they are chiefly terrestrial in their habits, still specimens of recent *Dorylinae* have been found in the Zanzibar copal.

In comparing the genera found in the amber with those of the recent ants, we learn that 19 belong to extinct genera, and 24 are still extant. These are as follows:—

EXTANT GENERA.

1. Cosmopolitan:
    - *Ponera*, 2.
    - *Aphaenogaster*, 3.
    - *Prenolepis*, 2.
    - *Camponotus*, 1.
2. Tropicopolitan:
    - *Platythyrea*, 1.
    - *Euponera* (*Trachymesopus*), 1.
    - *Iridomyrmex*, 5.
    - *Dolichoderus* (*Hypoclinea*), 9.
3. Paleotropical:
    - *Sima*, 5.
    - *Monomorium*, 2.
    - *Plagiolepis*, 6.
    - *Oecophylla*, 2.
4. Indomalayan and Australian:
    - *Ectatoma* (*Rhytidoponera*), 1.
    - *Vollenhovia*, 2.
    - *Gesomyrmex*, 2.
    - *Dimorphomyrmex*, 2.
    - *Pseudolasius*, 1.
5. Circumpolar:
    - *Stenamma*, 1.
    - *Myrmica*, 1.
    - *Leptothorax*, 5.
    - *Liometopum*, 1.
    - *Lasius*, 5.
    - *Formica*, 6.
6. Neotropical:
    - *Erebomyrma*, 1.

EXTINCT GENERA.

1. Allied to paleotropical genera:
    - *Prionomyrmex*, 1, allied to *Myrmecia*.
    - *Procerapachys*, 2, allied to *Cerapachys* and *Lioponera*.
    - *Bradoponera*, 1, allied to *Discothyrea* and *Spaniopone*.

Electroponera, 1, allied to *Ectatomma*.
Nothomyrmex, 4, allied to *Tetramorium*.
Stiphromyrmex, 1, allied to *Pristomyrmex*.
Parameranoplus, 1, allied to *Meranoplus*.
Enneamerus, 1, allied to *Myrmicaria*.
Protaneuretus, 1, allied to *Aneuretus*.
Paraneuretus, 2, allied to *Aneuretus*.
Rhopalomyrmex, 1, allied to *Plagiolepis* and *Myrmelachista*.
Prodimorphomyrmex, 1, allied to *Dimorphomyrmex*.
Glaphyromyrmex, 1, allied to *Formica*.
Dryomyrmex, 2, allied to *Aphomomyrmex*.

2. Of uncertain affinities :
Electromyrmex, 1.
Agraecomyrmex, 1.
Stigomyrmex, 1.
Asymphylomyrmex, 1.
Pityomyrmex, 1.

After careful reasoning from the evidence to be obtained from the above lists, Wheeler regards the ant fauna of the Baltic amber to be a mixture of the Palæarctic, Indian, Malayan, and Australian faunas. Most of the truly extra-European affinities were rare in the amber forests, and the most abundant ants (apart from the two species of *Iridomyrmex*) belong to *Formica* and *Lasius*, which are the two dominant European genera at the present time.

" A pronounced tendency towards a supplanting of the Indian, Malayan and Australian elements in the mixed amber fauna by Palæarctic elements is therefore very apparent as far back as the Lower Oligocene times, although it seems to have been permanently accomplished only by the advent of the Glacial Epoch."

It is difficult to decide whether the amber species co-existed as members of a single fauna throughout the life-time of the amber forests. The extent of these forests was very large, their southern boundary reaching across central Sweden, through Finland and Estland to Minsk and Tobolsk ; the adjacent sea covering northern Germany and the region drained by the Vistula, Niemen, and Dnieper as far as the Black Sea. The climate was sub-tropical, as is shown by the vegetation preserved in the amber, and it is supposed that part of the area at least was mountainous. It is therefore possible that different ant faunas co-existed at different elevations.

In the case of different species found in the same block of amber, it is at least clear that such species did exist together at the same time. Wheeler enumerates the following :—

Iridomyrmex goepperti with *Dolichoderus tertiarius*.
I. goepperti with *Nothomyrmica rudis*.
I. goepperti with *I. geinitzi*.
I. goepperti with *Lasius schiefferdeckeri*.
I. goepperti with *Dimorphomyrmex annectens*.
I. goepperti with *Formica flori*.
I. geinitzi with *I. samlandicus*.
Lasius schiefferdeckeri with *Formica constricta*.
Formica flori with *Camponotus mengei*.
F. horrida with *Leptothorax gracilis*.

Even here the more abundant forms may have been spread over the whole amber area, and persisted throughout its whole duration, and he others may each have had a more limited distribution in space and ime.

Wheeler is on the whole of the opinion that the tropical and boreal omponents of the amber ant fauna belonged to different periods of the Oligocene.

A certain number of amber ants resemble very closely species living o-day; and this resemblance, if it does not actually amount to identity, mplies almost a lineal descent of the latter from the former. These re :—

Extinct.	Extant.
Ponera atavia Mayr, and	*P. coarctata* Latr.
Dolichoderus tertiarius Mayr, and	*D. 4-punctatus* L.
Prenolepis henschei Mayr, and	*P. nitens* Mayr.
Lasius schiefferdeckeri Mayr, and	*L. niger* L.
L. nemorivagus Wheeler, and	*L. umbratus* Nyl.
Formica flori Mayr, and	*F. fusca*, L.
F. horrida Wheeler, and	*F. cinerea* Mayr.
F. phaethusa Wheeler, and	*F. truncicola* Nyl.

Some amber ants are more generalised and primitive in their structure than their nearest modern allies. *Prionomyrmex* may be mentioned as being more primitive than the allied *Myrmecia*, the Australian "Bull-dog ants," which are the most primitive of all modern species. The amber species of the genus *Oecophylla* are also somewhat more primitive than the modern *O. smaragdina* of the Old World tropics. Wheeler records 51 specimens (of two species of *Oecophylla*) from the amber, all of which are workers, with the exception of one male. I may mention in passing that a very large number of the Isle of Wight fossil ants belong to species of *Oecophylla*, the majority of which, however, are males and females.

Wheeler refers to other cases of archaic types, but as a rule the amber ants are as highly specialised as existing forms. It is not unlikely that living species of any of the extinct genera may turn up in little explored portions of the Old World Tropics. Indeed, such was the case when a living species of *Gesomyrmex* was found in Borneo years after this genus had been discovered in the amber.

The various castes or phases are also as sharply differentiated, and n the same manner as in the recent forms, and polymorphism has been eveloped not only in the worker caste, but also in the male and female orms. Major and minor workers occur in several amber species, and hough it is true no "soldiers" have yet been detected, it is nevertheless probable that they did exist.

Females of *Platythyrea primaeva* and *Bradoponera meieri* belong to he ergatoid or apterous type. Emery has described a pseudogynic emale of *Camponotus mengei*, and Wheeler discovered two pseudogynes f *Prenolepis henschei*. Mayr regarded a specimen of *Iridomyrmex onstrictus* as a gynandromorph, but Wheeler, who figures this insect, s satisfied that it is an ergatomorphic male of the extreme type, with he head more like the worker, such as exist to-day in our British *Ponera punctatissima* and *Formicoxenus nitidulus*.

The larvæ and pupæ of the Baltic amber ants were also as highly specialised, and similar in form to those of the modern species. The pupæ of *Lasius* we find in cocoons, and those of *Iridomyrmex* are naked, the latter fact showing that the *Dolichoderinae* had lost the cocoon-spinning habit as far back as the early Tertiary.

The habits and instincts were nearly if not quite as advanced then as now. A number of specimens have been found in one block of amber together with plant-lice, showing that these ants had learnt to attend Aphids, and as some myrmecophilous beetles occur in the amber, it is evident that the ants already kept myrmecophiles in their nests. Wheeler figures a worker of *Lasius shiefferdeckeri*, one of two specimens, each of which is bearing a mite attached to the base of one of the hind tibiæ. This not only shows that these ants had Acarine parasites, but also that the latter had already acquired the habit of affixing themselves to definite parts of their host's body, as is the case with species of *Cilibano* and *Antennophorus* to-day. It is also probable that the amber ants had established parasitic relations with one another, as in our present slave-makers and temporary social parasites.

Wheeler was unable to find any *Formica* species with a clypeus formed like that of our present *F. sanguinea*, but as his remarkable *Pityomyrmex tornquisti* (although it belongs to the *Dolichoderinae*) bears a striking resemblance to the modern "Amazon ant," *Polyergus rufescens*, he considers it is probable it possessed similar habits. *Formica phaëthusa* Wheeler belongs to the *F. rufa* group, and as shown by Wheeler in America, Wasmann in Holland and Luxemburg, and the writer in Britain, all the known forms of this group are temporary social parasites on *F. fusca* or some of its varieties; it is therefore extremely probable that *F. phaëthusa* founded its colonies with the aid of *F. flori* colonies.

In connection with the genus *Formica*, Wheeler writes:—"With the discovery in the Baltic amber of three new species of *Formica*, one allied to the recent *cinerea* and two belonging to the *rufa* group, Wasmann's recent speculations concerning the phylogeny of the genus are deprived of their last slender support and fall to the ground, because it can be no longer asserted that *F. flori*, which is very closely related to the recent *F. fusca*, is the oldest and most primitive species, and that *F. rufa* and *F. sanguinea* are descended from such a form."

It is very difficult to fix the time and place of the origin of the *Formicidae* as a family, as no ants are known from the periods antedating the Baltic amber.

Handlirsch has suggested that as some primitive Hymenoptera occur in the Upper Jura, and ants are found in the Lower Tertiary, the original ancestors of the latter cannot have put in an appearance before the Upper Chalk. As Wheeler, however, points out, very few Mesozoic insects are known, and it is evidently possible that ants may have coexisted with more primitive Hymenoptera during the Jurassic, just as the primitive group of Blattoidea (cockroaches) coexist to-day with highly specialised and very recently evolved insects.

Wheeler agrees with Handlirsch, that our present knowledge of Formicid distribution does away with the necessity of postulating the existence of great sunken continents, and is willing to agree that the family may have originated in Eurasia. Handlirsch, however, was mistaken in thinking that the North American Tertiary ant-fauna was insignificant. The existence of numerous fossil ants which Wheeler has examined from the Florissant shales, makes it very probable that there must have been ants in North America during the Eocene, and if the migration of the family took place from Eurasia, as Handlirsch supposes, it must have antedated the beginning of the Tertiary at the latest.—HORACE DONISTHORPE.

Notes on the ovum and larva of Trifurcula immundella, Zeller.

By ALFRED SICH, F.E.S.

Of the small genus, *Trifurcula*, we have three species in Britain. The slight experience I have had of *T. atrifrontella* leads me to believe that it may be attached to the oak, and in a letter, received some years ago, from Mr. E. R. Bankes, the same opinion was expressed. *T. immundella*, in the larval state, does mine under the bark of *Cytisus scoparius*, and the food plant of *T. pallidella*, the remaining species is, in all probability, *Genista tinctoria*. I have delayed publication of my note on *T. immundella* in the hopes that I might have been able to complete the account of its life-cycle. Perhaps some other observer will have the opportunity of doing this. The points that require further observation are the following:—When does the larva naturally leave the mine, in winter or in the spring? Where does it pupate? Of what form is the pupa? Are there two broods during the year or one only? Anyone having easy access to a common, where broom is plentiful, might obtain a solution of these questions. It will be seen by a reference to J. W. Tutt's *British Lepidoptera*, vol. i., p. 355-6, that it has long been known that the larva of this species was attached to the broom.

On the afternoon of September 4th, 1907, I was fortunate enough to find a number of the imagines of *Trifurcula immundella*, Zell., flying over broom bushes on a Surrey common. These small moths fly freely between 6 and 7 p.m. around the bushes. The flight is usually not a long one, but fairly rapid, and often pendulum-like, from one part of a bush to another part. Once or twice I have seen the moths fly up high till they were lost to sight. At the end of each short flight they alight on a broom twig and run up and down, turning with marvellous rapidity, till they find a leaf, on the upper surface of which they rest. If no leaf be present, which is often the case, they come to rest on the twig. When resting between the flights they hold the antennæ outspread at right angles to the body, but when really resting (sleeping?) the antennæ are concealed beneath the body, which position brings the white eye-caps right down over the black eyes, which are then quite hidden. The wings are held rather closely to the body. In the resting position the moth reminds one more of a *Lithocolletis* than a *Nepticula*. I took one pair *in copula*, they rested back to back, one partly covered by the wings of the other.

The next day found me on the same spot, and I watched two females ovipositing. The moth flies on to a broom twig and runs rapidly up and down till she finds a suitable situation, when she remains still whilst pressing the abdomen on to the twig and laying the egg. The ovum is laid singly on the bark of the last formed shoots, generally near the top, in one of the furrows of the twig. On September 11th I visited the place again and found many ova on the broom twigs. Four more females were seen ovipositing. In every case they proceeded as already described and always came to a standstill with the head uppermost. In all cases the moth, after laying, crawled up to the top of the twig and rested some time. There were several moths resting on the leaves and crosswise on the twigs, but these were inactive, and possibly males. Nearly all the moths observed this day were rather worn. On the 20th only two moths were seen, so that the flight was over for the year.

Under a lens the ovum is hardly to be distinguished from that of a *Nepticula*, except that it is not quite so flat and scale-like, and is much more even in outline. I am, however, really only comparing this ovum with that of *N. acetosae*, as I scarcely know the egg of any other *Nepticula* until the larva has left it. The egg, however, may at once be separated from that of *Cemiostoma spartifoliella*, which occurs in the same situation, by its entirely different shape. To put it broadly the former is a dome and the latter a lozenge. When newly laid the ovum appears pale green, but as the shell is thin the colour is probably caused by the green of the broom bark showing through the practically colourless egg. In general outline the egg is oblong ovoid and measures about 0·37mm. in length and 0·24mm. in width. It gradually rises from the circumference to the centre, forming thus a rather flat dome. The shell is irregularly, but very finely, punctured all over. The egg adheres to the bark so closely that it has more the appearance of a blister raised from the skin of the bark than that of an object lying on the surface. In spite of this the egg and its border of gum comes off rather easily, and it is then seen that the underside of the ovum takes an exact imprint of the broom bark. The egg soon assumes a yellow tinge, and then for a day or two becomes grey, but as the yellow larva forms it can be seen through the shell, so that gives the egg a yellow appearance, which continues until the larva hatches. I believe that the oval stage lasts from a fortnight to three weeks, according to the weather, but I have no exact data to go on. On hatching the yellow larva bores through the base of the egg shell and under the cuticle of the bark of the broom, eating out the parenchyma. By the time the larva is well out of the egg the vacated shell is filled with black excrement and appears much the same as the ova of Nepticulids under similar circumstances. The larva now continues its mine down the stem. This species appears always to mine *down* the stem for the first few mm. Whereas *Cemiostoma spartifoliella* always appears to mine *up* the stem when young. The broom stem is four-sided, at each corner is a rib or ridge, and between the ridges run grooves. The egg is laid in a groove, the larva soon after hatching makes its way under the cuticle to the nearest ridge and then mines straight down, keeping just below the top of the ridge. After making a mine from 6-8mm. long in about a week, the larva comes to rest and prepares for the first ecdysis. It then appears as an orange termination of the mine about 1mm. long. The larva mines venter uppermost.

The larva in its first and subsequent instars reminds one very strongly of the Nepticulid larva. The colour of the small head is brown and that of the body bright yellow-ochreous, except the tenth abdominal segment, which, in the first instar, is grey with a semi-transparent appearance. In the first instar the width of the head is 0·09mm. The head is almost entirely enveloped in the wide prothorax. The body of the larva becomes gradually narrower until the ninth segment, which is much wider than the eighth, while the tenth segment is very small and carries a pair of posterior points on each side. In the interior of the tenth abdominal segment there are two short rods like those we see in the Nepticulid larva. There are a few spicules on the skin, but I could not detect any tubercles or setæ, or legs or pads of any kind. The length of the larva is almost exactly 1mm. When about to change, the larva thrusts its old head into the side of the mine, soon commences feeding afresh, and as it progresses it gradually leaves its old skin behind. The larva in its second instar does not differ greatly from that in the first instar. It is rather stouter in proportion, but the relative width of the well-marked segments is much the same. The head measures 0·15mm., the length of the larva is about 1·6mm. The mine in the first two stadia is very flat and the frass is gathered into the centre, leaving a narrow pale border on each side. It thus forms a narrow black or very dark green track, which, when old, appears as a black stain in the bark. The mine often runs straight down beside one of the ridges of the twig, sometimes passing through the ridge and continuing on the other side. More often, however, I think, the larva after mining down from 5mm. to 10mm., turns and mines up the stem for a short distance and then down again. When mining upwards it sometimes crosses its earlier mine, thus forming a short loop. When the larva has mined in this way to a length of from 16mm. to 20mm. it again lays up for a change of skin. Soon after the change the larva, now in its third instar, leaves the ridge of the stem and commences mining down the centre of one of the furrows. The cuticle of the bark is now slightly raised and assumes a brownish hue. The larva appears pale greenish in the mine and may be seen feeding in a Nepticulid manner. It still leaves a broad, irregular central line of black frass, which appears of a dusky tint when seen through the bark. It is not easy to see what the larva is doing under the bark as it is of no use to hold the broom twig up to the light, a plan that succeeds well enough with a leaf-miner. As in most of the lower leaf-miners, the larva in its third instar shows a considerable development. The width of the head is about 0·23mm., and length of the larva about 3mm. The colour of the head lines is brown and that of the body bright orange-ochreous. The prothorax is still very wide, and both the meso- and metathorax are much swollen above and carry each a pair of swellings or foot-pads beneath which are much spiculated. If my observation was correct then the large spiracle on the eighth abdominal segment is placed low down towards the venter, and as the larva mines lying on its back this position of the spiracle may be useful. On each side of the tenth abdominal segment there are two long spines, an upper and a lower. Progression is probably performed by means of the swellings on the thoracic segments and these strong lateral spines of the last segment. The larva continues its mine down the centre of the furrow until the whole mine reaches a length of about 33mm. It then lies up for what is probably the last change of skin. In the fourth instar the larva is very stout and the segmental divisions well marked. The head is small, flat, and grey, with the usual lines nearly black. The whole body is bright orange-ochreous. The dorsal aspect shows the prothorax to be very much wider than the small head, which is capable of being almost entirely withdrawn into it. From the prothorax to the first abdominal segment the larva increases much in width. The second abdominal is rather narrower, and the following segments are much of the same width, but the ninth abdominal is much narrower than the eighth, while the tenth is very narrow. In the lateral aspect the outline of the larva slopes evenly upwards from the head to the metathorax, then runs level along the back to the eighth abdominal, where it falls abruptly over the ninth and tenth segments. The ventral processes, which act as prolegs, are absent on the prothorax, but very strongly developed on the meso- and metathorax, they are also present on the other abdominal segments, except the eighth and ninth. Those on the tenth abdominal are especially useful. In crawling on a flat surface the larva arches its body, using the processes on the thorax and the tenth abdominal, not making much use of those intervening. There are no markings on the dorsum of the larva, but beneath are some quadrate and kite-shaped dark patches which I take to be the ganglia. The skin is much spiculated and the larva is provided with simple tubercles and setæ. The prothorax carries three pairs of setæ on each side of the median line. There is a single seta above the spiracle and a longer one below. On the mesothorax ii is very close to i, but on the abdominal segments ii is behind i and rather low down, it has a short seta, while i has a long seta. Tubercle iii is very small above the spiracle, while iv below carries a very long seta. Tubercles v and vi appear to be absent, but I think vii is present. There are three strong setæ on each of the thoracic processes. The width of the head is 0·38mm. and the length of the larva 4·75mm. In the tenth abdominal segment two rods, 0·15mm. in length, may be seen. Their anterior ends are attached to muscles which draw the ends near together or separate them, while the posterior ends are attached by muscles to a frame-work which runs round the posterior margin of the tenth abdominal segment. These movable rods are present in all the larval stages, and I have seen them in Nepticulid larvæ, but do not understand their use. I cannot find anything in the larva that would prevent its being congeneric with *Nepticula*. Except in size this larva does not differ from that of *Nepticula acetosae*, but I have not compared them side by side. The larva, in the fourth instar, continues its mine down the broom twig. The mine takes up the whole of the furrow and is much raised. It appears brown where the larva lies but all behind the larva is black. The larva does not confine itself to one furrow, but often passes through a ridge and down the adjoining groove. This part of the mine runs to a length of about 70mm., so that the whole mine from entrance to exit exceeds 100mm. When about to leave the mine the larva bites a narrow transverse opening through the cuticle and forces its head and thorax out of the mine. After this, by movement of the posterior segments, it completes the exit, The larva emerges venter uppermost and, curving its body into a horseshoe shape, falls from the mine. Those I had, on reaching the table cloth soon began crawling away. Unlike many Nepticulid larvæ they do not spin any silk at all during their progress. Some of the larvæ I put in a flower pot filled with light soil, they all went down very soon. One was placed in soft paper, but on opening this several days afterwards I found the larva curled up. It had made no attempt to spin and was quite lively, so it was transferred to the pot and it followed the example of the others. Three weeks later I turned the earth out of the pot and passed it all through muslin without finding any traces of the larvæ, either alive or dead. I imagine they must have somehow or other managed to escape. From this experience I imagine that the larva on leaving the mine passes the rest of the winter without forming a cocoon. In the spring it probably comes forth either to spin its cocoon or first, as I believe, Warren stated or suggested, to mine the leaves of the broom. When they left the mines the larvæ appeared to me to be quite full fed.

The eggs were laid in September, 1907, and it was on October 15th that I found the first larva in the fourth instar. This was evidently a very forward individual. The first vacated mine was found in the open on December 9th. Most of my larvæ came out of the mines between December 6th and January 4th. On the other hand, I found four larvæ in the field, still in their mines, on March 23rd, 1908. I have good reason to believe that the common broom is not the only food-plant, but that the larva may also feed on those brooms with rounded twigs, usually called Spanish brooms.

The Coloration Problem. II.

By W. PARKINSON CURTIS, F.E.S.

(Continued from page 82.)

25. **Dryobates major** race **anglicus,** Hartert.

Observer.—W. P. Curtis. Time.—Afternoon.
Date.—June 14th, 1914. Sex.—As below.
Place.—Canford, Dorset. Duration.—1½ hours.
Time.—12. Sex.—♀. Food.—Moth, caterpillar, and something else.
Time.—1.0. Sex.—♀. Food.—Unidentified.
Time.—1.0-30. Sex.—♂. Food.—Unidentified.
Time.—1.5. Sex.—♀. Food.—Unidentified.
Particulars as below. Duration.—1 hour.
Time.—2.10. Sex.—♂ and ♀. Food.—Unidentified.
Time.—2.20. Sex.—♂ and ♀. Food.—Unidentified.
Time.—2.25. Sex.—♀. Food.—Unidentified.
Time.—2.25-30. Sex.—♂. Food.—Unidentified.
Time.—2.30. Sex.—♀. Food.—Unidentified.
Time.—2.40. Sex.—♂. Food.—Unidentified.
Time.—2.43. Sex.—♀. Food.—No food brought.
Time.—2.52. Sex.—♂ and ♀. Food.—Unidentified.
Time.—3.0. Sex.—♀. Food.—Unidentified.
Time.—3.2. Sex.—♂. Food.—Unidentified.

Note.—Heavy thunderstorm of extreme violence for one hour and twenty minutes, during which time the birds did not feed. After it was over, as I was drenched and trees and heath fired about 80 to 100 yards from my tent by the blinding flashes, I left off for the day. I found I was really too far off to see well. The first observation was made whilst I was outside my tent arranging decorations, and the ♀ came into a tree within a few feet of me and gave me a good view.

Same nest.
Observer.—W. P. Curtis. Time.—Morning.
Date.—June 17th, 1914. Duration.—1 hour.
Time.—6.35. Sex.—♂. Food.—Unidentified.

Time.—6.50. Sex.—♀.
Food.—Some large bulky insects (? order) held crossways in the bill.

Time.—6.52. Sex.—♂. Food.—Unidentified.

Time.—6.57. Sex.—♂. Food.—Unidentified.

Time.—7.7. Sex.—? Food.—Unidentified.

Time.—7.15. Sex.—♂.
Food.—Three fair sized Geometer moths and three or four large green Geometer larvæ.

Same nest.
Observer.—W. P. Curtis. Time.—Morning.
Date.—June 25th, 1914. Duration.—2½ hours.
Time.—10.35. Sex.—? Food.—Unidentified.

Time.—10.40. Sex.—♂. Food.—Unidentified.

Time.—11.5. Sex.—♂. Food.—Unidentified.

Time.—11.7. Sex.—♀. Food.—Unidentified.

Time.—11.10. Sex.—♂. Food.—Mouthful of Scopariids.

Time.—11.14. Sex.—♀. Food.—Unidentified.

Here follow nine observations in which the food was not identified on any occasion.

Time.—12. Sex.—?
Food.—A large moth, species unidentified.

Here follow eight observations in which the food has been unidentified.

Same nest.
Observer.—W. P. Curtis. Time.—Afternoon.
Date.—Same. Duration.—1 hour 50 minutes.
Time.—3.15. Sex.—♀. Food.—Unidentified.

Time.—3.22. Sex.—♂. Food.—Unidentified.

Time.—3.45. Sex.—♀. Food.—Unidentified.

Time.—3.56. Sex.—♂.
Food.—Unidentified. On this occasion the ♂ hunted all over the nesting tree and got nothing. I know that there was no moth that my eyes could detect on that tree, but occasional flies settled on it, and I saw a young bird pick up a fly once.

Here followed five visits to the nest. Food unidentified three times. No food brought twice.

Time.—4.45. Sex.—♀.
Food.—A mouthful of Scopariids.

I left the tent here. Later on I met one of the birds in another part of the copse with a good sized *Noctua* in its bill.

The early part of this day was bright sunshine.

Same nest.
Observer.—W. P. Curtis. Time.—Morning.
Date.—June 24th, 1914. Duration.—Casual.
Time.—6.40. Sex.—?. Food.—Unidentified.

Time.—6.52. Sex.—?. Food.—Unidentified.

Time.—6.52. Sex.—?.
Food.—A Dipterous fly settled near the entrance of the nest and was nabbed by a young bird.

Time.—7. Sex.—♂. Food.—Unidentified.

Time.—7.7. Sex.—♀. Food.—Minute insects ? order.

Here follow four observations, and on each occasion I was unable to identify the food.

On June 28th, 1914, the nest was empty.

Observer.—E. H. Curtis. Time.—10.45.
Place.—Same copse. Duration.—Casual.

One of the young that had left the nest on June 28th, 1914, was seen stripping loose birch bark to hunt for insects, by E.H.C. Could not see the food.

The following notes relate to the same pair of birds, in the same copse, but in another tree. We were able to get much nearer with the aid of a high pair of steps, and I calculated we were 22 feet away.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—June 10th, 1915. Duration.—2 hours and 1 quarter

Time.—3.20. Sex.—♂. Food.—Unidentified.

Time.—3.30. Sex.—♀. Food.—Entered nest to feed.

Time.—3.35. Sex.—♂. Food.—Regurgitation.

Time.—3.39. Sex.—♂.
Food.—"Very leisurely fed all the young. I was of opinion the food was the bodies of moths of a grey colour."

Time.—3.45. Sex.—♂. Food.—Regurgitation.

Time.—3.52. Sex.—♀. Food.—Regurgitation.

Time.—3.53. Sex.—♂. Food.—Regurgitation.

Time.—3.58. Sex.—♀. Food.—Regurgitation.

Time.—4.1. Sex.—♂.
Food.—The food again seemed to be chewed up moths.

Time.—4.2. Sex.—♀. Food.—Unidentified.

Time.—4.8. Sex.—♂. Food.—Unidentified.

Time.—4.9. Sex.—♀. Food.—Unidentified.

Observer.—W. P. Curtis. Time.—Morning.
Date.—June 13th, 1915. Duration.—2¼ hours.

The birds fed the young all the time I was getting myself settled, and I was at least one hour getting myself and my camera comfortable, but I do not consider my observations started till 9.45.

Time.—9.55. Sex.—♂.
Food.—One moth and eight large Geometer larvæ.

Time.—10.5. Sex.—? Food.—Unidentified.

Time.—10.15. Sex.—♀. Food.—A mouthful of larvæ.

Time.—10.22. Sex.—♂. Food.—Unidentified.

Time.—10.32. Sex.—? Food.—Unidentified.

Time.—10.37. Sex.—♂.
Food.—Larvæ and small insects, too quick to determine order.

TIME.—10.44. SEX.—♀. FOOD.—Unidentified.

TIME.—10.45. SEX.—♂.

FOOD.—Insects and larvæ, including what looked like a large Geometer moth of grey colour.

[NOTE.—In this connection I might mention that a specimen of *Boarmia repandata* was resting high up on a lime (*Tilia europaea*) on the underside of a considerable limb, about 15 feet from the ground, at 8.30 a.m. I went to examine this insect at 12.30 p.m. and it had gone. The tree was about 120 yards, or perhaps 180 yards W. ½ N. of the nest. It is impossible to say this was the insect, but it is an explanation that would fit the known facts.]

TIME.—10.52. SEX.—♂. FOOD.—Unidentified.

TIME.—10.55. SEX.—? FOOD.—Unidentified.

TIME.—11.1. SEX.—?

FOOD.—"Some very small food." This is my note, but I am not able now to remember what I meant by it, but I think it meant visible and not regurgigated food.

Here follow six visits to the nest with food unidentified, followed by a visit by the ♂, who put his head right into the nesting hole, and another two minutes later when he fed by regurgitation.

TIME.—11.36. SEX.—♀.
FOOD.—"Very small food." See above.

TIME.—11.40. SEX.—♀.
FOOD.—Two larvæ of *Taeniocampa stabilis*, they were carried at the base of the mandibles and passed to the young with the tongue; both given to the same nestling.

TIME.—11.43. SEX.—♀.
FOOD.—Three or four larvæ of *Cheimatobia brumata*.

TIME.—11.50. SEX.—♂.
FOOD.—A great number of very small insects that I was unable to identify.

TIME.—11.55. SEX.—♂.
FOOD.—Several larvæ, and at least one *Tephrosia punctularia*. The sun now threw the nest into deep shadow and I left to do some collecting. I came back later, about 4 p.m., and photographed the locality to show the hiding tent, when the ♂ settled in a bough close to me (about 10 to 12 feet) with four fair-sized Geometer moths in his bill.

OBSERVER.—E. H. Curtis. TIME.—Morning.
DATE.—June 16th, 1916. DURATION.—2 hours.

TIME.—7.50, SEX.—♀.
FOOD.—Partly larvæ and partly by regurgitation.

TIME.—7.51. SEX.—♂. FOOD.—Larvæ.

TIME.—8.5. SEX.—♀. FOOD.—Brown larvæ.
Here follow three visits with food unidentified.

TIME.—8.29. SEX.—♂.
FOOD.—Partly by regurgitation and partly by unidentified food.

TIME. 8.35. SEX.—♀.
FOOD.—A body of a grey moth and a large Geometer caterpillar.

Time.—8.39. Sex.—♂.
Food.—Brown larvæ which did not look like Lepidopterous larvæ.

There followed 13 visits with unidentified food.

Observer.—E. H. Curtis. Time.—Morning.
Date.—June 18th, 1915. Duration.—1 hour 55 minutes.

Twenty visits were recorded, but E.H.C. was unable to identify the food on a single occasion.

Observer.—W. P. Curtis. Time.—Morning.
Date.—June 20th, 1914. Duration.—2¼ hours.
Time.—7.32. Sex.—? Food.—Unidentified.

Time.—7.40. Sex.—? Food.—Partly by regurgitation.

Time.—7.46. Sex.—? Food.—Unidentified.

Time.—7.50. Sex.—?
Food.—A number of Diptera and Hymenoptera of no great size.

Here follow three visits with unidentified food.

Time.—8.3. Sex.—♀.
Food.—Larvæ, apparently of *Hybernia.*

Here follow two visits with unidentified food.

Time.—8.20. Sex.—? Food.—Larvæ.

Here follow three visits with unidentified food.

Time.—8.35. Sex.—♂.
Food.—Two small moths about the size of a *Xanthorhoë* (*Melanippe*) *fluctuata* and various other oddments.

Here follow six visits, five with unidentified food, and one when the ♂ was frightened off by a sparrowhawk.

Time.—8.56. Sex.—♂.
Food.—A grey *Noctua*, rather smaller than *Acronicta psi*. [On subsequent reflection I think this may have been *Cleocera viminalis*, which does occur, though as far as I can make out very very sparingly, that is the only *Noctua* which fits in really well.]

Here followed three visits with unidentified food.

[I had to stop at this point. E.H.C. wanted my tall steps, tripod and tent to put up to a pair of *Picus viridis* he wanted to try in colour. However, I thought it would be interesting to see what would happen if I offered the young, which were now nearly full-grown, a moth, so I netted a *Cabera pusaria*, inserted into a little cleft in a stick and held it up to the hole; just for a second the young bird held back, but the moth was too great a temptation and he went for it like a hungry bass going for smelt, and then leaned out of the hole in our direction and chattered vigorously. Later in the day I got a small hiding tent, and to make up for increased distance discarded the camera and used my binoculars.]

Time spent like this totalled 2½ hours.

Time.—2.7. Sex.—♂.
Food.—"Small food." See note above.

Here followed three visits, once unidentified and twice by regurgitation.

Time.—2.40. Sex.—♀.
Food.—Partly with larvæ and partly by regurgitation.

TIME.—2.55. SEX.—♂.

FOOD.—A moth for size and colour like *Bupalus piniaria* ♀.

[N.B.—There were plenty of this species close at hand.]

Here followed two visits, one unidentified food and one by regurgitation. I was then absent half an hour.

I then recorded four visits, three unidentified food and one by regurgitation. At 4.25 I left off observing.

[NOTE.—Here again summarising is difficult, but 177 observations were recorded, 33 times the food was identified, and twice there was no food, 14 times the food was wholly or partly regurgitated. On 13 occasions it was definitely one or more Lepidopterous imagines.]

(*To be concluded.*)

Records of some New British Plant-Galls. VI. Ninety-nine New British Gall-mites (Eriophyidæ).

By RICHARD S. BAGNALL, F.L.S., F.E.S., and J. W. H. HARRISON, M.Sc.

(*Continued from page 101.*)

Subfamily. PHYLLOCOPTINÆ.

60. *Phyllocoptes comatus*, Nal.

Hazel. Houard, 1063.
DURHAM, Winlaton Mill.
LANCASHIRE, Grange-over-Sands, R.S.B.

61. *Phyllocoptes schlecthtendali*, Nal.

Pear-tree. Houard, 2865.
DURHAM, Gibside, R.S.B.

62. *Phyllocoptes fockeni*, Nal. et Trouess.

Plum-tree. Houard, 3278.
DURHAM, Gibside, R.S.B.

63. *Phyllocoptes retiolatus*, Nal.

On Tufted Vetch. Houard, 3724.
DURHAM, Birtley, J.W.H.H., and Wear banks near Penshaw, R.S.B.

64. *Phyllocoptes gymnaspis*, Nal.

On Sycamore. Houard, 3972.
Records from DURHAM, CUMBERLAND, and LANCASHIRE, R.S.B.

65. *Phyllocoptes epiphyllus*, Nal.

On Ash. Houard (*Eriophyes*), 4646.
Records from NORTHUMBERLAND, DURHAM, CUMBERLAND, WESTMORLAND, LANCASHIRE, CHESHIRE. and YORKSHIRE.

66. *Phyllocoptes anthobius*, Nal.

On Bedstraws. Houard, 5249, 5282.
Records from NORTHUMBERLAND, DURHAM, CUMBERLAND, and LANCASHIRE.

67. *Phyllocoptes psilocranus*, Nal.

On Crosswort, local. Houard, 5315.

Records from NORTHUMBERLAND, DURHAM, YORKSHIRE, and CUMBERLAND.

68. *Phyllocoptes rigidus*, Nal.

On Dandelion, rare. Houard, 6091.
NORTHUMBERLAND, Ninebanks, J.W.H.H.
DURHAM, Gibside, Penshaw, and Lanchester, R.S.B.

69. *Epitrimerus trinotus*, Nal.

On Alder, probably not rare. Houard, 1131.
DURHAM, Horsleyhope Burn and Sharnberry Gill, R.S.B.

70, *Epitrimerus cristatus*, Nal.

On Oak. Houard, 1308.
LANCASHIRE, Grange-over-Sands, R.S.B.

71. *Epitrimerus massalongoianus*, Nal.

On Oak. Houard, 1314.
DURHAM, Gibside, R.S.B.

72. *Epitrimerus rhynchothrix*, Nal.

On Buttercup, apparently rare. Houard, 2434.
DURHAM, Eastgate in Weardale, R.S.B.

73. *Epitrimerus armatus*, Can.

On Hawthorn. Houard, 2952.
NORTHUMBERLAND, Ovingham, and DURHAM, near Swalwell, R.S.B.

74. *Epitrimerus coactus*, Nal.

On *Plantago lanceolata*. Houard, 5155.
DURHAM, Gibside.
LANCASHIRE, Grange-over-Sands, and YORKSHIRE, Redcar.

* * * * *

ERIOPHYIDÆ undescribed, imperfectly known or only known from the galls.

75. *Eriophyes* sp. Houard, 67.

On Bracken.
CHESHIRE, Bidston Hill, R.S.B.

76. *Eriophyes* sp. Houard, 213.

On *Holcus lanatus*.
DURHAM, Gibside, R.S.B.

77. *Eriophyes* sp. Houard, 485.

On White Poplar.
DURHAM, Fencehouses, R.S.B.

78. *Eriophyes* sp. Houard, 630 (S. 56).

On *Salix alba*.
LANCASHIRE, Freshfield, R.S.B.

79. *Eriophyes* sp. Houard, 1054.

On Hazel.
LANCASHIRE, Grange-over-Sands, a few examples ; in one case more than two dozen dwarfed catkins in a single bunch, R.S.B.

80. *Eriophyes* sp. Houard, 2063.

On Wych Elm.
Durham, Winlaton Mill, R.S.B.

81. *Eriophyes* sp. Houard, 2306.

On Soapwort.
Durham, Wear banks near Penshaw, R.S.B.

82. *Eriophyes* sp. Houard, 2680.

On Shepherd's Purse.
Durham, a few examples, Penshaw, R.S.B.

83. *Eriophyes* sp.

On *Laurus nobilis*. Underside of leaf, in angles caused by junctu of lateral nervures with midrib, furnished with a patch of curly hairs white at first, turning brown ; cocoon-like in larger specimens.
Lancashire, Grange-over-Sands, on every bush, R.S.B.

84. *Eriophyes* sp. Houard, 2858.

On Pear-tree.
Durham, Penshaw, R.S.B.

85. *Eriophyes* sp.

On Laurel (*Prunus lauro-cerasus*). Depressions at angles of ne vures on underside of leaf lined with hairs. Corresponding "wart on upperside turning blackish.
Durham, Penshaw and Gibside.
Lancashire, Grange-over-Sands, R.S.B.

86. *Eriophyes* sp. Houard, 3416.

On Broom.
Records from Northumberland, Durham, and Cheshire.

87. *Eriophyes* sp. Houard, 3684.

On *Hippocrepis comosa*.
Westmoreland, on Meathop Fell, near Grange-over-Sands, profus and no doubt occurring where the plant occurs within the Lancashi border.

88. *Eriophyes* sp. Houard, 3772.

On Meadow Vetchling.
Several records from Northumberland, Durham, Lancashire, a Yorkshire.

89. *Eriophyes* sp. Houard, 3808.

On *Geranium pratense*.
Northumberland, Budle Bay, J.W.H.H.
Durham, Ryhope, R.S.B.

90. *Eriophyes* sp. (? *Eriophyes euphorbiae*, Nal.).

On *Euphorbia paralias*. Leaves with margins rolled.
Lancashire, Sandhills near Ainsdale, rare, R.S.B.

91. *Eriophyes* sp. Houard, 3973.

On sycamore.

Lancashire, Grange-over-Sands, rare, R.S.B.

92. *Eriophyes* sp. Houard, 4216.

On St. John's Wort, rare.
Durham, Gibside.
Cumberland, near Alston, R.S.B.

93. *Eriophyes* sp. (? Houard, 4638.)

Ash, affecting the bud.
Records from Northumberland, Durham, Lancashire, Cumberland, and Yorkshire.

94. *Eriophyes* sp. Houard, 4788.

On Wood-sage.
Lancashire, Grange-over-Sands, local, R.S.B.

95. *Eriophyes* sp. Houard, 5036.

On Toad-flax.
Durham, Wear banks near Penshaw.
Lancashire, near Ainsdale, R.S.B.

96. *Eriophyes* sp.

On Crosswort (*Galium cruciatum*). Causing abnormal pilosity of stem, leaves and floral peduncles.
Records from Northumberland, Durham, Lancashire, and Cumberland.

97. *Eriophyes* sp. (? Houard, 5675.)

On Yarrow. Flower head aborted, massed and thickened, covered with a thick white felt.
Records from Northumberland and Durham.

98. *Eriophyes* sp. Houard, 5690.

On Yarrow.
Durham, Penshaw and Hylton, R.S.B.

99. *Eriophyes* sp.

On Knapweed (*Centaurea nigra*). Head large, interior hypertrophied, hard; flower developing badly. Probably the same as described in Houard (no. 5954) on *C. jacea*.
Durham, Fatfield and Cox Green, R.S.B.

Correction.—p. 98. No. 27, for *Eriophyes enaspis* read *E. euaspis*.
p. 99. No. 41, for *Eriophyes laccinatus* read *E. laticinctus*.

Brenthis pales, its history and its named forms.

By Hy. J. TURNER, F.E.S.

(*Continued from p. 104.*)

In 1892 Fritz Rühl, in *Soc. Ent.*, vol. vii., p. 113, described a form of *B. pales* as ab. *killiasi* as follows.—

"Alis anticis supra deficientibus vitta arcuata media et ordine punctorum postmarginalium; generatim paucis strigis minoribus, valde obsoletis et parvum expressis; alis posticis basali et disco nigris, unicoloribus, omnibus venis undique usque ad marginem incrassate nigris, tantum margine antemarginali et interiori alarum rufescenti colore. Subtus alis anticis signis nigris paucis, obsoletissimis, alis posticis sine punctis marginalibus. Habitat in Rhætia."

Very few markings on forewing, hindwing almost wholly black, only traces of marking on underside forewings, the outer marginal spots wanting on the underside hindwings.

In discussing *pales* Rühl said that if one has a large number of both *isis* and *napaea* it is almost impossible to separate them as the two forms intergrade so largely, and that *sifanica* seems only ordinary *pales*.

Leech, *Butt. of China*, vol. i., p. 224 (1892), described *pales* from China. "Bright fulvous, spotted with black; bases dark. Marginal fringes plain. Underside forewings with very indistinct black spots; hindwings with a marginal row of pearly or silvery spots; the area of the wing variegated with yellow, purple, and reddish-brown, and with silvery spots mostly with a triangular outline."

His specimens, taken at over 9,000ft., are very brightly coloured, with less silvery marks than in the usual European form, although they agree very well with some Swiss forms. The Chinese specimens do not agree with the Himalayan forms, *sipora*, Moore, *baralacha*, Moore, or *generator*, Stgr.

In the *Stett. ent. Zeit.*, p. 124 (1893), A. Hoffmann remarked on the var. *lapponica* taken by him in N. Finland as follows: "While my *arsilache* from the Upper Harz vary for the most part in one direction, *viz.*, by more or less strong darkening of the discal area of the forewings, in the N. Finnish *lapponica* a strong blackening of the whole surface of the wings is more apparent. I took one female example, which showed very strong darkening of all the wings on the upperside, the underside of the hindwings wholly bright, greenish-yellow, little marbled with brown; the brown basal area wholly wanting, and conspicuously so from the strong extension of the silver spots; the silver marginal spots are also strongly produced towards the base. Thus the general appearance of the markings on both the hindwings differs, and on the whole is so much obliterated that little of the typical *arsilache* marking is to be seen."

In 1893 Grum-Grshimailo, *Hor. Ent. Ross.*, vol. xxvii., p. 128, described a new form of *B. pales* from the Palæarctic region (Central Asia) as var. *altaica*.

"Alis maris subtus, feminae supra et subtus, pallidioribus, obtusioribus." In the Altai mountains.

Staudinger, *Cat.*, ed. iii., p. 34 (1901), put *altaica* as synonymous with *isis*.

Hofmann, in 1894, *Grs.-Schm. Eur.*, ed. ii., plt. 9, fig. 146, gave a good representation of *arsilache* ♀ ?, and in fig. 14a, one of a well-marked ♀ *pales*. The letterpress, p. 16, is only a short summary of facts as to forms.

Rühl, in *Pal. Grs.-Schm.*, vol. i., p. 424, etc. (1895), goes into considerable detail as to the range of variation of marking in the type form, and also in that of the chief named forms, *i.e.*, a full summary of what had previously been written.

He considered, *Pal. Gross.*, p. 796 (1895), *sipora* and *baralacha* as synonymous with *pales*; says that according to Elwes, *pales*, H.G., must be *isis*: says that Elwes considers that the possibility that *arsilache* may be a true species, is not yet excluded; says Elwes remarks that *caucasica* most resembles the *pales* form of the Pyrenees, but the underside is more strongly spotted, and stands midway between *pales* and *arsilache*: says that *graeca* in its underside and fringe characteristics agrees with many Alpine and Himalayan specimens.

Rühl is doubtful whether *isis* ♂, which is distinguished by larger size, is to be held as other than *pales*. The ♀ *isis* is easily distinguished from *pales* by its far darker upperside, but doubtfully from *napaea*, since both varieties run into one another. In a large mass of material there are many intermediates, and the distinction between *isis* and *napaea* does not stand. He considered that *lapponica* forms a transition to *arsilache*. He put var. *arsilache*, Esp.=*napaea*, Dup.=*pales*, O. He made *caucasica*, Stgr.=*arsilache*, H.S.

On the whole, Rühl's remarks emphasise the necessity of collating all the named forms from the type localities, if it be possible, before the really true significance of the various names can be ascertained. With a species which occurs in very large numbers in its habitats over such a vast area of the two continents, there arises every possible grade of intermediate form, a fact which makes it the more difficult to be sure that a particular locality is the geographical area where a particular form is the dominant one.

In 1899 Moore, *Lep. Ind.*, vol. iv., p. 244, pl. 375, figs. 2, 2a, 2d, gave an account and description of *sipora*. This description does for *pales* quite well as a general view, and the figures support this view. They represent forms which in shape, colour, and markings, both ♂ and ♀ are essentially *pales* of the Alps.

On page 245 Moore redescribed Staudinger's *generator*. He stated that it differs from *pales* and *sipora* in that the forewing is more subtriangular in shape, the costa more arched, the outer margin curved and less oblique, with markings as in the usual *pales* forms. On the underside the discal markings are obsolete in the forewing, which is pale fulvous in ground colour. The ground colour of the hindwing is yellowish, with marginal pale olive-brown markings similarly disposed as in *pales*. The pearly-white spotting is well developed. The figures are larger and somewhat pale in ground, while the underside of the hindwing shows less tesselation of the shades of colour.

Lambillion, in 1900 in *Cat. Lep. Belg.*, p. 9, included var. *arsilache* in the list of Belgian Lepidoptera, but expressly states that the type does not occur.

In the *Ent. News*, vol. xi., p. 383 (1900), Dr. Holland described a Brenthid, which came from the mountains of Alaska, as *Brenthis pales* var. *alaskensis*, from a single example. He says that the underside is "much as in typical *pales*," but "it differs widely upon the upper surface." It seems nearest to Staudinger's var. *generator* of the Transaltai. "The fuscous area of the tarsal portion of the primaries and secondaries is reduced, extending outwardly only to the middle of the cell, and the entire wing beyond this is bright reddish fulvous, with the characteristic lines and spots narrow and fine."

Galvagni, in 1900, *Verh. z-b. Ges., Wien.*, vol. 52, p. 565, 2 figs., in a paper on the Lepidoptera of the Brenner district, gave an extended account of the variation of *B. pales*, including descriptions of three aberrations with two very clear figures (which he abstained from naming).

1. Var. *arsilache*, ab. ♀.

"Supra obscurior, nigricans, subtus al. ant. pallidioribus maculis paucis nigris, post. fusco rufoque mixtis, fasciis mediis flavescentibus nullis."

"On July 28th, 1899, I obtained on the Mähdern des Mieslkopfes two especially dark females, which instanced the extreme of this variety, and I give the following description of the darkest specimen. The expansion reaches 38mm. The upperside dark red-yellow, lightly blackish powdered, the basal part of the fore- and hindwings black. On the forewings the black streaks in the middle cell very strong, also the angular spots of the row in the disc adjoining them, the round spots beyond very large (1.5mm. to 2mm. expanse), and from cell 3 to the neighbourhood of the apical part run together into a band, the border black, with red-yellow powdering between the veins. On the hindwings the transverse streaks feeble, the round spots large, the border black with dark red-yellow roundish spots.

"The underside of the forewing is dull coloured, the black marking on the cross vein, a transverse line in the centre of the middle cell, and four black round spots in cells 1b, 2, 3, 4 restricted, the yellow apical spot very dark with rust-brown tinge. The hindwings rust-brown and rust-red mingled, with three small, silky shining white spots at the base, three larger ones in the disc, a similar one in cell 2, and round marginal spots from cell 3, of which the two last in cells 7 and 8 are yellow.

"The description of the underside exactly agrees with the Tyrolean local race.

"With the smaller dark race from N. Finland the Tyrolean specimens have no similarity whatever."

2. Var. *napaea* ab. ♀.

"Supra fascia antemarginalia lata nigra."

Galvagni says that he caught this aberration, a ♀, *in cop.* with an *isis* ♂. At the same time there were many pairs, mostly *isis* males with *napaea* females.

"The specimen is especially characterised by the marginal black spots on the fore- and hindwings having run together. The basal part of the forewing is blackish suffused, of which the spot bands are pallid, those of the hindwing bright red-yellow. Below the black markings are absent up to the transverse vein; the hindwings as in normal variegated specimens."

I take this form to be simply a step towards the next aberration, which is from the figure a very fine form.

3. Var. *napaea*, Hb., ab.

"Alis supra nigerrimis, virescentibus, maculis marginalibus (praesertim in al. post.) flavescentibus subtus ut *napaea*, Hb., al. post. maculis nigro-fuscis (nec rufis)."

"Almost at the same time as the former aberration I took at the same place a unicolorous melanic specimen, which by reference to the marking of the underside belongs without doubt to this variety. The example, a truly magnificent specimen, is quite freshly emerged; the expansion of wing is 39mm. Antennæ as in a normal *napaea*. The basal parts, particularly on the hindwings, abundantly furnished with red-brown hairs. The upperside is unicolorous black with a greenish sheen, the costa at the base and the apical part powdered yellowish, similarly yellowish short marginal streaks between the veins, on the margins of the hindwings between the veins chequered spots of the same colour. The fringes on the forewings are black and yellowish chequered, on the hindwings intersected. The marking on the underside is normal, the forewings are black suffused and strongly marked, on the hindwings the colour contrast is so particularly strong that it changes from red-brown to black-brown and to black."

Galvagni, in conclusion, makes the following general observations: "Dr. Standfuss (*Hand*, ed. 2, p. 202, 1896) gives as reasons for melanism, individual praedisposition, and heat, the natural view points to the first proviso, the latter reason appears to depend on chance. July had failed to bring the alpine flora to a quicker development, even in the highest places, until the middle of the month, a delay of the normal time of flowering by an interval of about three weeks had occurred, a circumstance which is not without influence on the insects. Thus in the year 1899 *pales* flew on the Madern des Blaser on July 20th and 22nd, the type form and the form *arsilache*, var. *isis* and var. *napaea* I obtained in the same locality, quite fresh, for the first time on August 14th. The note of Dr. Standfuss, that melanic specimens are always the largest does not hold in this case. Out of 16 specimens of *napaea* a quite normal specimen of the form is the largest and has an expansion of 43mm., the smallest measures 37mm., the melanic form is 39mm. The average is 40mm.-42mm."

In 1901 Staudinger, in his *Cat. Lep. Pal. Fn.*, ed. iii., p. 35, sums up the accepted continental opinions at the time as follows:—

"*pales*, Schiff. (*arsilache*, Esp., 56, 4), (*killiasi*, Rühl.) (*isis*, Hb., 563-4 ♀).

"ab. ♀ *napaea*, 757-8 (*pales*, H.G., 964), ' ♀ supra virescens.'

"var. et ab. *isis*, Hb., 38-39 ♂ (*altaica*, G.-Gr.), 'major, pallidior, signaturis nigr. minor., ♂ subt. sulphureus.'

"var. *generator*, Stgr. (*graeca*, Alpher., Hor. xvi.), 'praec. v. similis, ♂ saturatius fulvus, multo minus [saepe in disco nullo modo] nigro-signatus, ♀ lunulis antimarg. subalbidis.'

"var. *lapponica*, Stgr. (transitus ad *arsilache*).

"var. *arsilache*, Esp., 56-5 (*inducta*, Spång.) (*napaea*, Dup., i., 48), 'al. ant. subt. nigro-maculatus.'

"var. *caucasica*, Stgr. (*arsilache*, HS., 259-62), '♂ saturatius fulvus, subt. pallidior.'

"var. *graeca*, Stgr., Hor. vii., 'subt. pallidior, ciliis albo-nigroque variis.'

"var. *sifanica*, G.-Gr., Hor. xxv., 'praec. var. simillima (*caucasica*), plerumque minor, patria tantummodo distinguenda.'

"var. *sipora*, Moore. (*barachla*, Moore.), 'var. *caucasica* et var. *graeca* similis'" (recte *baralacha*).

In 1902 Lambillion, in his *Pap. Belg.*, p. 101, says that var. *inducta* is the form from Finland and Lapland, var. *killiasi* is from the Juliers, var. *sifanica*, from Amdo, *generator* from Fergana, etc.

In *Cat. N. Am. Lep.*, p. 16 (102), Dyar places the var. *alaskensis* next to *Brenthis myrina*.

In 1903 Wheeler, in his *Butt. Switz.*, p. 80, gives the direction of variation as shown in Central Europe as—

(*a*) Gradual predominance of yellow over red-purple underside, culminating in vars. *isis*, Hb., =*altaica*, Gr.-Gr.
  (1) An aberration of *isis* ♀, having upperside shot with a dull purplish tint, *napaea*, Hb.
  (2) A further *isis* aberration, less shot with purple, but with a broad band of united black spots across fore- and hindwings upperside, *cinctata*, Fav.
(*b*) Underside forewing with conspicuous black spots (wanting in type), var. *arsilache*, Esp., =*inducta*, Spångberg.

(*To be continued.*)

CURRENT NOTES AND SHORT NOTICES.

The United States National Museum has recently published *A Revision of the Bembicine Wasps of America North of Mexico*, by John Bernard Parker. It consists of about 150 pages with 8 pages of illustrative details and appears to be of more than usual interest. "The *Bembicini* is a tribe of solitary wasps belonging to the group, *Fossores*, or Digger Wasps. This tribe and the *Stizini* compose the family *Bembicidae*. Among these wasps the individuals are either male or female, and the latter constructs her nest alone and provides for her offspring. These nests are burrows dug in the ground, usually in sandy places, and, although each female constructs a burrow for herself, the wasps generally nest in colonies, which may be made up of several species. The most prominent characters distinguishing the Bembicine wasps are (1) the non-folding wings lying flat on the back, (2) the three closed cubital cells of the anterior wing, (3) of which cells the second receives both discoidal cross veins, (4) the absence of a prepectus, (5) the prominent exserted labrum, and (6) the lack of developed ocelli." Preliminary paragraphs deal with the anatomy sufficiently to follow the subsequent descriptions of species, which descriptions are, in this contribution, much more comparative than are those in many of the publications issued by the National Museum. In fact every species herein described has one paragraph or more devoted to a discussion of relationships with other species in the genus. The group is divided into six genera, *Steniolia*, *Stictia*, *Stictiella*, *Bicyrtes*, *Bembix* and *Microbembix*, each of which is introduced by several pages of general remarks, together with an analytical key to the species contained in it. At the end nearly 20 pages are devoted to a summary of the work which has been done on the biology of the various species, including not only that by previous workers, such as Lapeletier, Fabre, and others, but much that has been done by the prolonged observation and experiment of the author himself in the haunts of several of the species. One of the most interesting questions discussed is "How do these wasps find the entrance to their burrows?" The results of the author's observations force him to conclude that they do so through the sense of smell, or some power similar to smell. The paper concludes with a bibliography.

The *Journal of Entomology and Zoology* for the first quarter of 1917 contains contributions by the students and others working in the Pomona College Department of Zoology, Claremont, California, U.S.A. These are mainly biological notes on species met with in the neighbourhood, of which hitherto very little has been known. This number discusses (1) the rose flea-beetle, *Haltica probata*, which will probably prove a pest on cultivated plants; (2) a small whip-scorpion, *Trithyreus pentapeltis*, on the tibia of which are very long fine hairs or setæ set in little pits, one on each leg and two on the fore-legs; (3) Notes on Chalcid Flies; (4) two interesting Pseudoscorpions; (5) a considerable amount of marine zoology; and (6) an account of the Summer School at Laguna Beach and its work, with views of the neighbourhood under investigation. The magazine is to be commended for the number and clearness of its very numerous diagrams and illustrations which enlighten every article.

The *Entomologist* for April contains detailed contributions concerning the new species of Geometer, of which examples were exhibited at the Annual Exhibition of Varieties of the South London Entomological Society in December last. It has now been recorded n N. Devon, E. Devon and Cornwall, and always in very swampy parts of dark woods, and in company with *Lampropteryx suffumata*, rom which it differs in size, shape of wing, general facies, number of broods, time of appearance, food-plant (not yet known), genitalia, and bsence of intermediate forms.

In the *Bull. Soc. ent. France* for March, M. J. de Joannis records hat *Lyonetia clerckella* has been met with in the larval state in the eaves of *Prunus laurocerasus*, at Lisieux, which accords with a previous ecord by M. Joannis himself. M. A. L. Clement records and escribes a new form of *Polygonia c-album* as ab. *cloqueti* from Bouray; melanistic form in which the black spots on all wings are confluent on ach wing in a large blotch with a single large discoidal on the fore-wings, and the c-mark on the underside much modified. From the igure it would appear to much resemble some of the forms produced nder cold conditions.

The *Irish Naturalist* for April contains the Presidential Address of Prof. G. H. Carpenter to the Dublin Naturalist's Field Club, in which he gave some of his own reminiscences to "illustrate how frequently tudies which the naturalist pursues for the love of them may turn out o be useful in the economic sense; how frequently, too, a piece of work ndertaken for the sake of medecine or agriculture may lead the nvestigator into paths of high theoretical interest." As an instance we may quote the following interesting paragraph, "More than twenty years ago, my visit with some of the members to the Mitchelstown Cave led me first to take an interest in those lowly wingless insects, he 'springtails' or Collembola, several blind species of which are ncluded in our Irish cave fauna. At that time beyond a few observations there was nothing to show that the insects had any conomic importance, and the severely practical man might have hought that an entomologist, in devoting days and months to their ystematic study, was hopelessly wasting his time. During the present century, however, it has been found both in Ireland and in Britain hat several kinds of Springtails are very harmful to roots and other nderground plant-structures, to fallen fruit and to foliage. It is easonable to suppose that the comparatively sudden rise of the Collembola to importance as injurious insects is not due to want of bservation in former years, but to an actual change in the mode of fe of the species observed. Thus the study of an obscure group of insects is found to have an unexpected economic bearing, and the behaviour of the creatures in relation to cultivated plants may give the naturalist an opportunity of noticing change of habit on a large scale—a fascinating line of enquiry from the biological point of view. In the case of one springtail, at any rate, such a change of habit has been certainly observed. Tobacco is a newly introduced crop in Ireland, raised entirely from seed. In April, 1907, tobacco seedlings were found to be covered with multitudes of dark greyish springtails, *Isotoma tenella*, a species hitherto unrecognised in the British Islands. There can be no doubt that this scarce insect had suddenly increased in numbers through the introduction of a new crop which happened to afford a large and suitable food-supply."

Three further contributions from the *Proceedings of the United States Museum* are (1) "New Species of Fossil beetles from Florissant, Colorado," by H. F. Wickham; (2) "New Tertiary Insects," by T. D. A. Cockerell, including Diptera and Hymenoptera, some also from the now famous Florissant beds; and (3) "A Monograph of the Nearctic Hymenoptera of the Genus *Bracon*, Fabricius," by H. Morrison. All three articles have plates illustrative of structural details.

The *Canadian Entomologist* for April contains an article of more than ordinary interest on "Insect Drift of Lake Shores," by J. G. Needham. It consists of an account of all the insects indentified by the writer during a prolonged stay on the shores of Lake Michigan, with careful notes on the various and varying conditions of his observations. In Coleoptera 26 families and 127 species were represented; Hemiptera, 9 families and 20 species; many Hymenoptera, Diptera and Lepidoptera too dilapidated for identification; a few Neuroptera, Odonata and Orthoptera; while Trichoptera and *Ephemeridae* were largely represented by pupal and nymphal skins.

In the *Ent. Mo. Mag.* for April Mr. G. T. Porritt introduced a new and beautiful form of *Abraxas grossulariata*, which he names *albovarleyata*, since it is a derivative aberration of the well-known form *varleyata*, in the pale direction. The hindwings are white except the veins, a series of four interneural marginal spots, and a few freckles, of intense black. The forewings have large oblong-square white spots on the outer margin and a few other white features on costa and disc.

Those who want catalogues of all natural history sales must, under present regulations, apply for them by post-card to Messrs. Stevens.

A large portion of the collection of Lepidoptera of the late Mr. A. E. Gibbs, of St. Albans, will be disposed of on June 26th, together with his valuable and extensive library of entomological, botanical and natural history books. Probably for labels very few collections are more adequately furnished; this is especially so with the insects sent home by his own collectors in Central and S. America. These specimens are all labelled with locality, date, height above sea, and collector's name clearly printed.

Two further papers reprinted from the *Proc. U.S. Nat. Mus.* have reached us. (1) "Descriptions of new Lepidoptera from Mexico," by Harrison G. Dyar, in which the writer describes 111 new species, 8 new sub-species, with 7 new genera from material mainly collected by Messrs. R. Müller and Wm. Schaus. Scarcely a single species has anything more than a bald description without in most cases even the simplest of comparisons with other species in its genus, and biological notes are conspicuous by their complete absence. One genus only has an analysis of the species allied to the new one attached to it to show its relational position. It seems worse than useless to publish these isolated and unconnected descriptions, which can be used only when access can be had to a large mass of material. (2) "Field notes on Virginia Orthoptera," by Henry Fox, is full of biological notes which should prove of value. The summaries of the observations such as Lists of species typical of different areas, the Appalachian Mountain Province, the Coastal Plain, the Austral types in different provinces, etc., and the detailed topography of the localities, are all very useful for further work on the distribution of groups and species.

The Annual Address to the Entomological Society of London dealt with the subject of "Convergent Development among certain Ectoparasites." The President, the Hon. N. C. Rothschild, was unable to be present owing to ill-health and the address was read by the Rev. Jas. Waterston. The following is a list of the families and groups of insects in which ectoparasite species exist and which live on warm-blooded vertebrates.

a. With sucking mouth-parts.—*Anoplura*, *Cimicidae*, *Polyctenidae*, *Siphonaptera*, *Hippoboscidae*, *Nycteribiidae*, and *Streblidae*.

b. With biting mouth-parts.—*Mallophaga*, *Hemimeridae*, and *Platypsyllidae*.

Other insects may be called semi-parasitic, such as certain *Staphylinidae* found on mammals in S. America and the blind Silphid beetle, frequently observed in the burrows of mice. The admirable statement of the nature and conditions of this parasitism may be interesting to our readers. "Parasitism is not an original form of existence; on the contrary it is an acquired habit, acquired slowly through ages. Parasites are derived from non-parasitic forms, and the alteration of habit is accompanied by corresponding morphological changes. Parasitism and non-parasitism are two conditions somewhat analagous to pathological and normal states, the pathological being a modification of the normal or healthy tissue. The study of parasites and parasitism is fascinating and delightful to the speculative mind, as a comparison between the various parasitic insects and their non-parasitic relatives enables the observer to trace changes and modifications, which are more appparent among parasites than among normal insects. Ectoparasitism is a mode of life adopted by the members of several orders of insects, either in one stage of the life of the individual, or throughout its entire existence. In some cases it is only the young stages which adopt an ectoparasitic existence, for example, many mites; in others it is the imago only which is an ectoparasite, for example, fleas; while in others again, the parasitic habit obtains from birth to death, as in the case of *Anoplura* and *Mallophaga*. Some of these Epizoa never leave the host on which they dwell and feed, while others are temporary visitors only when they are in need of food. A third association appears to occur in at least one case, the case of *Hemimerus*, a parasite on an African rat, which appears to use its host more as a means of locomotion than for any other purpose, it being supposed that the *Hemimerus* does not secure any food from the skin of its host. The great variation which obtains in the degree of parasitism, in the number of hosts frequented, and in the orders from which parasites are derived, has naturally produced numerous and varied species of parasitic tracheates. Notwithstanding this fact, even the casual observer must notice the repeated recurrence in widely different orders of similar morphological details. While there is no general uniformity, many Epizoa exhibit points of remarkable resemblance. This agreement in certain characters may be likened to the colour similarity found in cave insects, or to the resemblance of certain marine animals to fish, or of subterranean lizards (*Amphisbaena*) to earthworms and snakes. In fact, parasites show that a similarity of surroundings is frequently accompanied by, or associated with, a certain amount of agreement in structure and colour." The body of the address is a short survey of the facts generalised in the above statements and illustrated by numerous diagrams of structural modifications.

It is intended to erect a bas-relief, with suitable inscription, in the Natural History Museum, South Kensington, to the memory of the late Captain F. C. Selous, D.S.O., as a memorial of his services to the Empire as a naturalist and explorer. A Committee has been formed, of which C. E. Fagan, Esq., Natural History Museum, Cromwell Road, London, S.W. 7, is Hon. Secretary, and to whom donations may be sent. A comprehensive list of names has been issued as members of the Committee.

The weather was most favourable for the Congress of the South-Eastern Union of Scientific Societies held in London from June 6th to June 9th inclusive, and the attendance was very good indeed, all the items in the programme having been carried out admirably. There is now a well-established Botanical Section of the Union, and it is hoped that in the near future there will also be a Zoological Section established. When things settle down after the war one would like to see definite work undertaken throughout the year by different sections, and that in the near future there may be separate meetings and papers devoted to the objects of each, *i.e.*, that the work may be intensive, rather than extensive with a tendency to a bias in one direction only as at present.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

April 12*th*, 1917.—DANAINE MODELS.—Mr. Edwards exhibited species of the genera *Nectaria* and *Hestia*, highly protected butterflies, and referred to their numerous mimics.

LYCÆNID ABERRATIONS.—Mr. B. W. Adkin, numerous aberrations of *Agriades thetis* and *A. coridon* taken at Eastbourne in September, 1916. Remarks were made as to the persistence of small local aberrations.

INTERESTING LITERARY ITEMS OF NATURAL HISTORY.—Mr. Hy. J. Turner, a book bought from a street barrow, *The Aye-aye*, by Sir Richard Owen inscribed "To P.B. du Chaillu from his friend and well-wisher Richd. Owen"; and a post-card illustrating a Fowling Scene from the wall of a tomb at Thebes, B.C. 1500, on which were pourtrayed five figures of butterflies.

PSYCHIDS.—He also showed a photograph of the cases of the more obtainable British Psychids and read notes on the characteristics and life-histories of the species.

NEW WORLD SPHINGIDÆ.—Mr. H. Moore, a number of species of Nearctic and Neotropical *Sphingidae*.

SECONDARY SEXUAL CHARACTER IN E. POLYCHLOROS.—Mr. Frohawk, the two sexes of *Eugonia polychloros*, and pointed out that the only secondary sexual character of distinction was the hitherto unnoted fact of the males possessing considerably larger eyes.

A SICILIAN SCARABÆUS.—Mr. Main, *Scarabaeus sacer* (?) from Sicily, and called attention to the very imperfect and worn condition of the tibiæ and tarsi with complete absence of claws caused by continued use.

PAPER.—Mr. R. Adkin read a short paper, "The Weather of 1916 and the Butterflies of Eastbourne."

AN INTERESTING OLD RECORD FROM IRELAND.—Mr. Frohawk read a letter from Tipperary, dated 1895, describing a butterfly existing there, which apparently was *Limenitis sibilla*.

April 26*th*, 1917.—EXHIBITION OF ORDERS OTHERS THAN LEPIDOPTERA.—Mr. H. Main exhibited living specimens of *Scarabaeus* from Malta and Sicily, and specimens of the oil-beetle *Meloë* with cells containing the bees, *Anthrophora pilipes*, on which it is parasitic.

Mr. K. G. Blair, (1) living gall-flies, *Aphilothrix radicis*, and the "truffle" gall from which they emerged; (2) *Psammochares cardui*, a new species of Pompilid bee recently described by Dr. Perkins; and (3) on behalf of Dr. C. J. Gahan, a living specimen of the Death-Watch beetle, *Xestobium tesselatum*, which responded to stimulus by tapping.

Mr. W. West (Epsom), an ancient microscope, date 1780.

Mr. Barnett, a Natterjack Toad from Mitcham Common.

Mr. H. Moore, a large number of insects from Demerara, ants, bees, wasps, flies, mantids, locusts and Hemiptera, including *Membracidae*.

Mr. Priske, tropical shells, including fine *Cypris* and "cowries."

Mr. Ashdown, Swiss and N. Italian Coleoptera taken in 1914, including about 40 species of Longicorn.

Mr. Lucas, a collection of British Earwigs and coloured enlarged drawings of the N. Forest Cricket (*Nemobius sylvestris*), and of the Giant Earwig (*Labidura riparia*).

Mr. Lachlan Gibb, a case of the American "bag-worm," *Thyridopteryx ephemeraeformis*, a large species of Psychid.

Mr. West (Greenwich), his collection of British Homoptera and drawers from the Society's reference collections, of Coleoptera, Diptera, Neuroptera, Hymenoptera, and European Coleoptera.

Mr. Turner, various species of British *Ichneumonidae*, British Hymenoptera, and Orthoptera.

Mr. Adkin, a copy of Fuessly's "Archives de l'histoire des Insectes," 1794.

Mr. Frohawk, a sketch of a male Blackbird noticed by him posing during courtship.

Mr. Edwards, boxes of Exotic Coleoptera, *Cicadidae* and Hemiptera.

May 10*th*, 1917.—DECEASE OF TWO MEMBERS.—The death of two members was announced, Mr. A. J. Scollick and Mr. F. H. Stallman, the latter from wounds in France.

R. PURDEYI IN LEWISHAM.—Mr. R. Adkin exhibited specimens of *Rhyacionia* (*Retinia*) *purdeyi* taken in Lewisham, and read notes on the history of the species as British.

BIRD ATTACKS ON LARVÆ IN STEMS.—Mr. Blair, a stem of aspen burrowed by the larva of the beetle *Saperda populnea*, a Longicorn, in which the burrows were slit open, no doubt by birds.

LIFE-HISTORY OF MELOË.—Mr. Hugh Main, specimens of the oil-beetle *Meloë* from near Woodford, with photographs of phases in its life-history.

REMARKS ON THE SEASON.—Mr. Newman, stems of nut from Otford with large gall masses on them; and living larvæ of *Agriades thetis*, and remarked on its great scarcity this year, where last year it was in great abundance. He also made remarks on the lateness of *Celastrina argiolus*, the late flowering of the blackthorn, and the scarcity of the larvæ of *Arctia villica* and *A. caja*.

RESTING HABITS IN P. RAPÆ AND P. BRASSICÆ.—Mr. Priske, noted the fact that *Pieris rapae* went to rest under the heads of daffodils thus gaining protection. Mr. Frohawk said that both *P. rapae* and *P. brassicae* selected pale leaves as roosting perches.

ABERRATIONS OF P. ATALANTA.—Mr. Frohawk, a series of aberrations of *Pyrameis atalanta*, a species rarely liable to vary naturally, (1) with divided red band forewing, (2) white clouds in red band forewings, (3) increase of size of white spots in apex and in bands, (4) reduction of white apical markings, (5) extremely large and small specimens, (6) marginal bands clouded on hindwings, (7) black spots of hind-margin of hindwings absent, etc.

OBITUARY.

F. H. Stallman.

Mr. F. H. Stallman was one of the promising younger members of the South London Entomological Society and had been for a short time on its Council. He acquired his liking for entomology and nature study in general from his first schoolmaster, Mr. F. A. Oldaker, M.A., at Dorking, and with him spent many holidays in roaming about the classic grounds of Ranmore, Box Hill, Holmwood and Leith Hill. Change of environment only seemed to make his study grow upon him. At Dulwich College practically the whole of his spare time was given to natural history, each year he carried off the first prize at the College Society Exhibitions, and since leaving has kept up his connection with the College. Joining the S. London Socy. in 1912, he became a regular attendant and often exhibited at its meetings and joined in the numerous field-meetings with a keenness which boded useful future work. He had been in his father's business in Mincing Lane for seven or eight years until 1916, when he joined the London Rifle Brigade and went to France in July of that year. Subsequently he took part in several actions on the Somme gaining a distinction and was promoted to be corporal. On March 21st he was very severely wounded and died in hospital on April 8th after an operation. He was one of those attractive natures that we can ill afford to lose.—H.J.T.

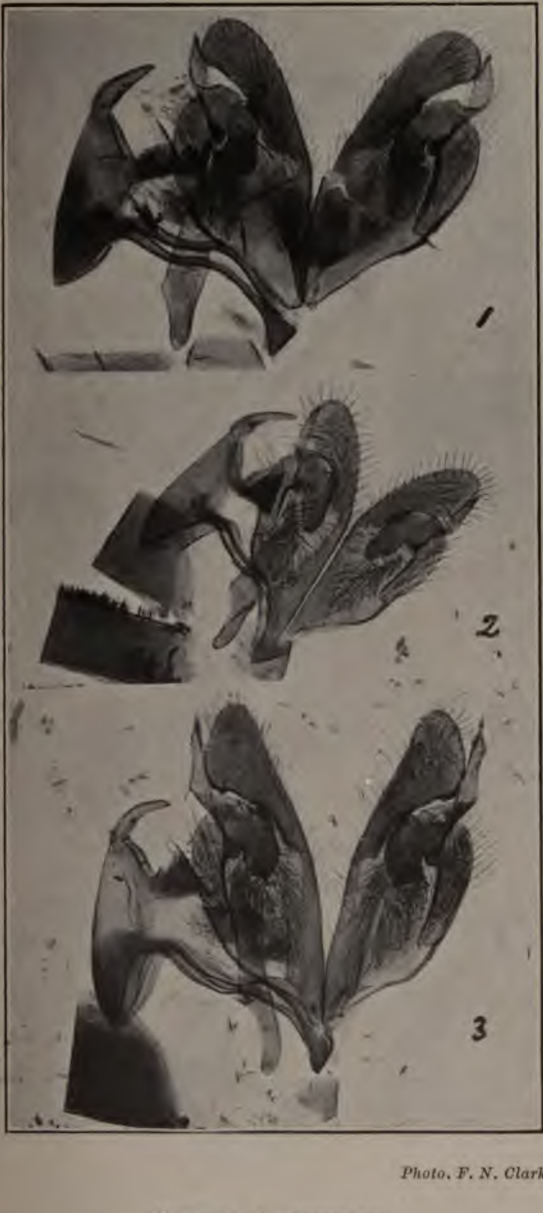

Photo. F. N. Clark.

HESPERIA ♂ APPENDAGES.
1. CENTAUREÆ. 2. ALPINA. 3. CACALIÆ. ×25.

The Entomologist's Record.

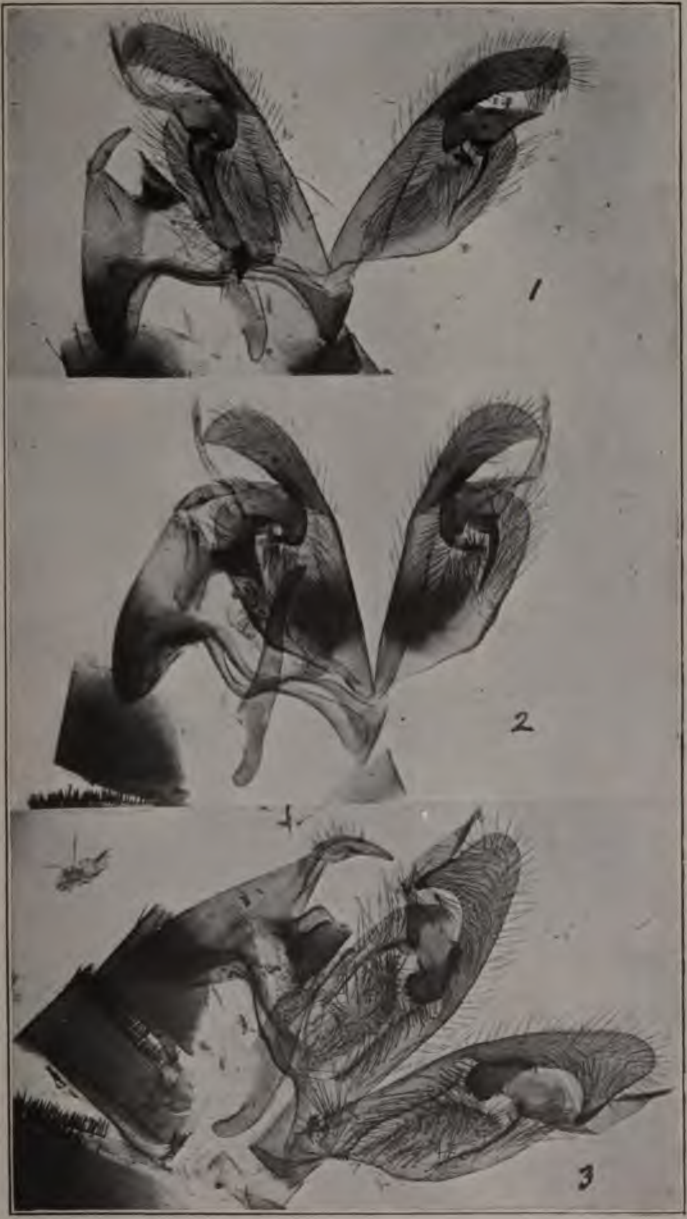

Photo. F. N. Clark.

Hesperia ♂ appendages.

1. Sibirica. 2. Andromedæ. 3. Sidæ. ×15.

The Entomologist's Record.

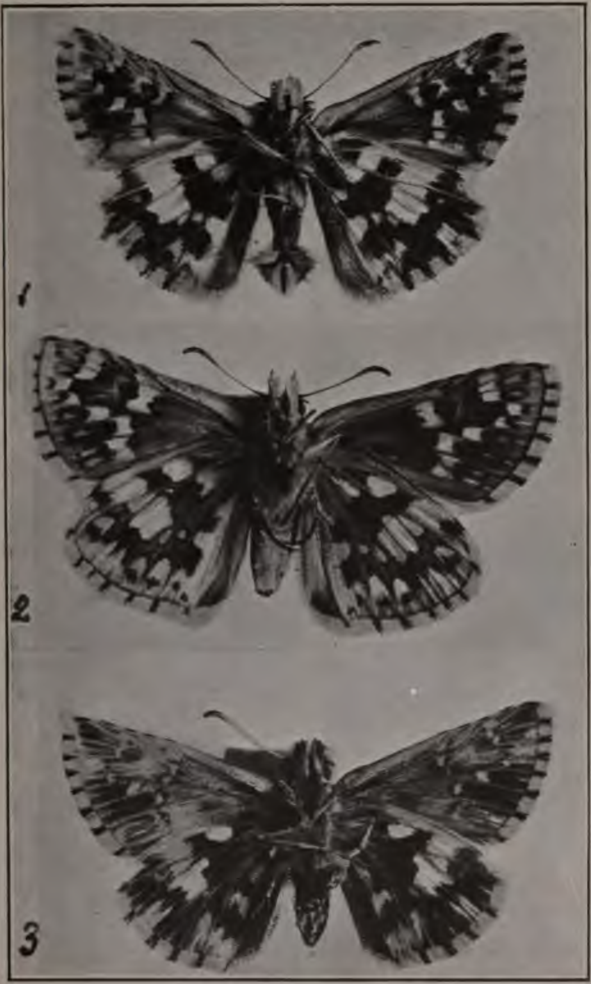

Photo. A. E. Tonge.

Hesperia undersides. 1. Alveus. 2. Carthami. 3. Cacaliæ. ×2.

The Genus Hesperia. (*With three plates.*)

By T. A. CHAPMAN, M.D.

(*Continued from page 95.*)

Dr. Reverdin associates with *H. carthami* two species of which I have no male specimens, *bieti* and *oberthüri*; whether these are like *carthami*, close to the *cacaliae* group, I do not know, but since Dr. Reverdin regards them as very close to *carthami*, it seems tolerably certain that they must be so. The *cacaliae* group are specially characterised by the "style" being rather long and slender and ribbon-like, close to its origin it makes a fold as if bent over, and looks as if one ought to straighten it out in mounting the preparation, this, however, is not feasible, the bend is the normal condition, and is not the result of pressing down flat a process that is merely curved. The style beyond this bend is straight and directed distad. The clasp in *carthami* is very like that of this group, say *alpina*, but differs in the style being solid and rounded, not flat and ribbon-like, and without bend or fold. Dr. Reverdin's figure of the armature of *H. cashmirensis* (of which I have no specimens) shows the clasp to be nearer that of *H. carthami* than to that of *H. cacaliae*, in which group Dr. Reverdin places it. The leading point of resemblance being that the style, instead of being flat and bent as in *H. cacaliae*, is rounded, at least comparatively, the small scale of the photograph prevents one being sure there is not some flattening, and is without bend. It may certainly be taken as connecting the two groups, or rather as welding them into one, which seemed otherwise a reasonable result to arrive at.

The *cacaliae* group has one peculiarity of wing marking, that occurs also in *carthami*, and is very pronounced in *sidae*, in some respects an outlying member of the *cacaliae* group. This is the special form of the discal spot beneath the forewing. In most Hesperias this is a definite spot, with definite outline like any of the other well-marked spots, but here its outer margin is blurred and is produced as a light cloud on the portion of the wing beyond. In the photograph of undersides in pl. ix. (by Mr. A. E. Tonge), this is well seen in that of *cacaliae*, where the pale cloud is seen, but hardly any spot; compare this with *alveus* (fig. 1), where the definiteness of the spot is well seen on the left side (right of picture). In *carthami* the tendency of the spot to lose its clear outline and extend outwards in a cloudy area is well seen on the right underside. This cloudy extension of the discal spot appears to be fairly constant in all examples of the *H. cacaliae* group. In other species of the more European sections the rule is to be without it, but it occurs as a frequent variation in some species, more usually as a radiant line or two along the veins. It occurs again in some species of the more Eastern section, which are only very distantly related to the *H. cacaliae* group.

Dr. Reverdin is the first to point out the fact that *H. sidae* is a member of the *H. cacaliae* group. This is at once obvious when one notes the general structure of the appendages, the form of the tenth sternite and the bent ribbon-like style.

That we always regarded *H. sidae* as a very special form, probably hardly related to our other European Hesperias, results from the tendency, so difficult to avoid, to be dominated by points that are superficially obvious, without reference to structural and other characters, as easy to observe, but not forcing themselves on our notice. If we compare *H. sidae* with *H. carthami* we find in the latter various specimens with a very warm tint of the ground colour, that suggest that it might easily lead up to the bright orange of *H. sidae*. The forms of the markings are very similar, there is a close resemblance in the three marginal spots on the hindwing below veins 2, 3 and 4. In no other species of the European section does there occur, as is often the case in *carthami*, and in some specimens of *H. centaureae* there may also be seen a clear indication of a dark marginal outline of the spots of the underside of the hindwing, obviously related to the dark margins of the spots in *H. sidae*, which so much emphasise the prominence of the orange bands. Dr. Reverdin remarks on the close resemblance of the underside of *H. antonia* to that of *H. sidae*, not only has it the same orange bands as in *H. sidae*, but they are also, or even more markedly, outlined in black. The acquisition of this special colouring must have been entirely independent in the two species. In confirmation of this, we find that in *H. antonia*, the white and orange spots in front of vein 7 are reversed as compared with *H. sidae*, what are white in *sidae* are orange, what are orange in *sidae* are white, and there is further an orange spot, with black margin, in *antonia*, at the wing base, in advance of vein 8, an area without any marking in *H. sidae*. The result, however, is that, without analysing the actual arrangement, the disposition of the orange bands and spots seem precisely the same in both. The two species are one of European, the other of Asiatic relationship, but their habitats are reported to extend in the one case Eastward in the other Westward, to Turkestan. So that mimicry is not an excluded explanation, supported no doubt by an identical result produced by a different disposition of markings. It might, however, be held that similar markings were produced in the two species, by similar forces, one acting in a European the other in an Asiatic area. In any case, it is fairly certain that the markings were separately evolved in the two cases, a similar generic constitution, rendering a similar result from similar causes to be more easily produced, though it is difficult to believe such an identity of effect without actual identity of markings could be produced apart from mimicry.

It is necessary to remember, however, that certain members of this group are after all rather Asiatic in distribution, if not in facies, than European, *sibirica*, *alpina*, *cashmirensis*, and even *centaureae*, the latter by the way often presenting some trace of a black line margining the spots beneath the hindwing; in marked contrast to the washed-out indefiniteness of the underside of *cacaliae*, for instance, in which the cloudy extension of the discal spot of the forewing seems to affect in some degree all the markings.

The appendages of this group agree with the *alveus* group (and other "European" forms) in having the two sides of the clasp comparatively parallel, and in the valve (more ventral element) being much longer than the harpe (dorsal element) apart from the style, which looks, and makes one regard it, as rather an appendage to, than as a part of, the harpe itself; this is not of course a correct view, but is useful in the comparison between the "European" and some "Asiatic" forms. These Asiatic forms have the harpe and valve of nearly the same length, the style is minimised and the harpe and valve are curved, so as to give the clasp a round (or square) outline, instead of a parallel sided, relatively narrow one. The difference largely consists in the development in the European section of the portion of the valve, Dr. Reverdin calls "the spoon" (cuiller), and of the style to correspond.

In the photograph of the appendages herewith offered, these characters are evident, as well as the structure of the tenth sternite, distinguishing them from the *alveus* and other sections. They all show the ribbon-like style very clearly, a little narrower perhaps in *andromedae* and *alpina*. *Sidae* is altogether larger, bolder than the others, and differs most in the outline of the tenth sternite, and in the strong teeth to the basal end of the style portion. In *alpina*, on the other hand, this basal end of the style is very free from teeth. It is needless to detail the differences in the relative proportions in the different species of the different portions of the harpe and valve, and of the style (end of the harpe), and the various outlines of the "spoon." These may all be easily seen in the photographs. It is only necessary to say that these differences, smaller or greater as they may be, are quite constant in the several species.

Of the species of the *cacaliae* group, one owes its recognition to Dr. Reverdin, *viz.*, *H. sibirica*, of which he gives a full account and diagnosis in the *Bulletin* of the Geneva Society for August, 1911 (vol. ii., fasc. 2, p. 78), with figures of the imago and of the appendages. Except that this species was first introduced by Staudinger as a variety of *andromedae*, it is remarkable in this group that there has never been any question as to the several species being clearly and certainly distinct, the more so perhaps that certain specimens of *cacaliae* and *andromedae* very much resemble each other.

Dr. Reverdin regards the spines that are at the end of the style as not being teeth. He says, "Its distal portion does not bear teeth, but hairs or spicules more or less numerous and more or less spread." The spines might be called spicules, but only if spicules means a small or special form of teeth, but not if it be synonymous with hairs. The spines are certainly not hairs, they have no basal articulation, but are an extension of the chitinous surface of the style, and in form are broad and lancet-shaped, and not at all like hairs, which abound on other portions of the clasp. An ordinary tooth or two may be seen at the end of the style (in *cacaliae* for example), the spicules extend back along the lower margin of the style.

H. cynarae seems to be somewhat intermediate between the *cacaliae* and *alveus* groups. The tenth sternite attaches it unmistakably to the *alveus* group, but the style almost equally claims relationship to that of *cacaliae*, it is long, ribbon-like, in one of my specimens bent precisely as in the *cacaliae* section, but in another slightly only, and certainly not fixed in the bent position as in the *cacaliae* group, the spines are evidently spines, are comparatively few, but extend back along the style as in the *cacaliae* group.

We may tabulate* the *cacaliae* section on wing markings as under.

European section.—I may repeat that European and Asiatic for the division that may be made of the Palæarctic Hesperias, will not bear criticism as to being an accurate description of the sections, but is simple and convenient, and conforms to our (some of our) ideas of the general facies of the two divisions.

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* In this and, I suspect, in any possible tabulation in the genus, the characters used will be more evident and therefore more trustworthy in a series than for an odd specimen, as there is a good deal of variation in each species, and any character used may be poorly pronounced in some individuals.

Group of *carthami* and *cacaliae* (10th abdominal segment in ♂, a complete circle). Discal mark of forewing beneath less a distinct mark, than a pale cloud continued outwards. This is not distinct in *bieti*.

Upperside.

A. Hindwing with markings, inner row of spots on forewing represented by one only on inner margin (*cacaliae* has similarly this single spot, but the hindwings are usually practically without markings).

1. Larger, discal spot absent.

a. Has a subcostal spot between inner and outer row, making three in longitudinal succession, and completing costally the circle of Lang's "Q mark." *sidae.*

b. Has no intermediate spot. *carthami.*

2. Smaller, discal spot present. *bieti.*

B. Hindwing poorly or well marked, if the latter, has none or more than one inner marginal spot of first row on forewing.

1. Spots always small, hindwing spotless, merely a light shade representing central spot, inner marginal spot of first row forewing generally absent. *cacaliae.*

2. Spots of ordinary size. Ground colour dark (without pale scaling, making the spotting conspicuous as black and white). Inner marginal spot wanting. Smaller and with shorter fore costa, giving a squarer aspect to the insect. *alpina.*

3. With three spots below large spot forewing. *andromedae.*

4. With two spots below large spot forewing.

a. Sometimes united, upper rarely absent, all spots larger and more distinct. *centaureae.*

b. Spots smaller, and when larger the white surface has a pale suffusion, beyond what occurs in *centaureae*, and the discal cloud characteristic of under surface in the group, is marked on upper surface. *sibirica.*

Underside.

A. Very definite alternation of coloured bands beneath hindwing.

1. Large, colours orange and white. *sidae.*

2. Smaller, colours reddish-brown and silver. *bieti.*

B. Ground colour beneath dull, spots not combined into bands.

1. Large, underside hindwing hind margin has three inner spaces with definite lancet-shaped spots, often with a black centre. (In *centaureae* these spots are often arrow-shaped, making a zigzag line, really very different, but the difference is not briefly to be described.) *carthami.*

2. Dark ground colour well-marked, very clearly outlined and divided by white lines on veins, giving by its sharp definition a chess-board-like effect. *centaureae.*

3. Similar to *centaureae*, but is more washed out and the outlines

less crisply defined. The zigzag marks (of *centaureae*) on hind margin more rounded, often reduced to spots only. *sibirica*.

4. The marginal marks of hindwing usually form a continuous line or band from vein 3 to vein 8. *alpina*.
5. The basal of the two spots between 1 and 2 veins hindwing distinct, well outlined, long and narrow, parallel to veins. *andromedae*.
6. Paler and less distinctly marked, ground colour pale ochreous, spots faintly ochreous tinted (not white), resulting in a vagueness and blurring effect, as compared with other species. *cacaliae*.

[*H. cashmirensis* and *H. oberthüri* omitted, as I have no specimens.]

(To be continued.)

The Coloration Problem. II.

By W. PARKINSON CURTIS, F.E.S.

(Concluded from page 126.)

26. **Picus viridis**, L. The Green Woodpecker.

Observers.—W. P. and E. H. Curtis.
Time.—Afternoon.
Date.—June 21st, 1913.
Sex.—As below.
Place.—Canford, Dorset.
Duration.—3 hours.

Food.—(Watched with × 25 glasses from 200 yards.) After two hours ♀ returned with a beakful of grey fluffy material, a regular mass. The bird was suspicious of our presence and watched from a bough near the nest, and gave us an opportunity of scrutinising the food, we came to the conclusion that it was certainly moths, and W.P.C. thought they were *Boarmia repandata*, but it will be obvious that that is something very like guesswork.

Five minutes later the ♂ arrived, but we could not see what he brought.

Note.—We have found from subsequent experience that this particular part of the afternoon is the worst for this bird, as it seldom feeds the young in the afternoon.

Observer.—W. P. Curtis.
Time.—Afternoon.
Date.—May 14th, 1916.
Sex.—♂.
Place.—Canford, Dorset.
Duration.—Casual.

Food.—Observed to tear out the nest of a small black ant and consume larvæ, pupæ and imagines.

Observer.—E. H. Curtis.
Time.—Afternoon.
Date.—June 14th, 1914.
Sex.—As below.
Place.—Canford, Dorset.
Duration.—1 hour 50 minutes.

Food.—Unidentified every time. Three visits only, two by ♀ and one by ♂. Both parents entered the nest to feed. Observations cut short by heavy thunderstorm, referred to by W.P.C. under *D. m. anglicus*.

Same nest.
Time.—Morning, 6.30.
Date.—June 17th, 1914.
Duration.—1 hours.

Food.—Neither parent fed.

Same nest. Time.—Morning.
Date.—June 21st, 1914. Duration.—2 hours 5 minutes.
Food.—Two visits by female. Unidentified.

Same nest. Time.—Afternoon.
Date.—June 21st, 1914. Duration.—2 hours 35 minutes.
Food.—Four visits by parents, three by ♀, one by ♂; no food identified. Parents entered nest to feed.

Same nest. Time.—Morning.
Date.—June 24th, 1914. Duration.—1 hour.
Food.—Two visits, both by ♀. She entered nest once, and fed with her head in the hole once. Impossible to identify food.

Same nest. Time.—Morning.
Date.—June 28th, 1914. Duration.—4 hours.
Time.—7.45. Sex.—? Food.—No food.
Time.—8.0. Sex.—♀.
Food.—Fed by regurgitation. E.H.C.'s note runs as follows: "She fed the young five times in the following manner:—She held her head straight up and extended her neck, and then retched and opened her bill, and what looked like a cartridge or projectile of chewed up grey moths came up between her mandibles, and as she shot her head forward into the nesting hole the projectile slid forward toward the mouths of the nestlings."

Time.—8.10. Sex.—♂. Food.—No food.

Time.—9.0. Sex.—♀ (?).
Food.—By regurgitation. E.H.C.'s note is, "I was able to distinguish a very limp partially digested Lepidopterous larva."

Time.—9.40. Sex.—♀ (?). Food.—By regurgitation.

Time.—10.45. Sex.—♀. Food.—By regurgitation.
E.H.C. then left for a while but later put in 1½ hours further.

Time.—12.20. Sex.—♂ and ♀. Food.—Not seen.
W.P.C. then took on observing for 1¾ hours.

Time.—2.5. Sex.—? Food.—Not seen.

Time.—2.40. Sex.—♀. Food.—By regurgitation.
[Note.—Having been up since 4.30 a.m. we felt at this point that we had done our duty by a pair of the most difficult and suspicious birds we had ever had the misfortune to observe.]

Observer.—W. P. Curtis. Time.—Morning.
Date.—July 5th, 1914.
Place.—Same nest. Duration.—2 hours 10 minutes.
Time.—11.30. Sex.—♀. Food.—By regurgitation.

Time.—12.20. Sex.—♀.
Food.—Poked head into entrance of nest for three minutes, but I could not tell whether she fed young or not.

Time.—12.24. Sex.—♂.
Food.—By regurgitation; took six minutes and gave all the food to one backward chick.

Time.—1.25. Sex.—♀. Food.—By regurgitation.
[Note.—As it had rained steadily since 7 a.m. I left the nest.]

Observer.—E. H. Curtis. Time.—Morning.
Date.—June 10th, 1915. Sex.—?
Place.—Canford, Dorset. Duration.—4 hours.
Food.—Neither bird fed young, nor did ♂ feed ♀, who seemed to be sitting, though on several occasions she put her head out to exchange a few words with the ♂, who was feeding on the ground and in trees close at hand, searching carefully. E.H.C. could not see from limited peepholes what he got.

Observers.—W. P. and E. H. Curtis. Time.—Afternoon.
Date.—June 20th, 1915. Sex.—?
Place.—Another nest at Canford, Dorset. Duration.—3½ hours.
Food.—Neither parent fed young.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—25th June, 1915. Sex.—♂.
Place.—Same nest as June 20th. Duration.—1 hour 45 minutes.
Food.—Unidentified.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—June 27th, 1915. Sex.—As below.
Place.—Same nest as June 20th. Duration.—1 hour 35 minutes.
Time.—4.5. Sex.—♂. Food.—Unidentified.
Time.—5.0. Sex.—♀. Food.—Unidentified.

Observers.—W. P. and E. H. Curtis. Time.—Afternoon.
Date.—July 3rd, 1915. Sex.—As below.
Place.—Same nest as June 20th. Duration.—2½ hours.
Time.—3.35. Sex.—♀. Food.—Unidentified.
Time.—4.0. Sex.—♂. Food.—By regurgitation only.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—July 4th, 1915. Sex.—♂.
Place.—Same nest as June 20th. Duration.—3½ hours.
Food.—One visit only; by regurgitation.

On July 10th we tried to resume, but the young had flown.

[Note.—A most unsatisfactory series of observations. Taking the nest observations alone, 32 hours 45 minutes spent watching only produced 32 visits to the nest, less than one per hour. On no occasion can it be said that the identification of the food was entirely satisfactory. Once we both felt certain it was moths. Once E.H.C. thought it was moths, but his note shows he could not definitely state that this was what it was. Once he recognised a larva.

The casual observation disclosed feeding on ants on the ground, but this is an exceedingly well known habit.

On the whole I do not think the evidence can be put higher than this, as far as recognised the food was insect food, and once was Lepidoptera.]

27. **Iynx torquilla**, L. The Wryneck.

Observers.—Smith Whiting, E. H. and W. P. Curtis. Time.—All day, any hour.
Date.—June, 1916. Sex.—Both parents.

PLACE.—New Milton, Hants. DURATION.—Uncertain.

FOOD.—Mr. Smith Whiting had a pair of these birds under observation in a nesting box in his garden. He said that the food seemed to be exclusively the pupæ of ants. E.H.C. and W.P.C. spent between them five hours at this nest. They only saw the one kind of food brought except for a solitary wood louse. They found each parent visited the nest individually about every eight minutes. That is one bird every four minutes.

28. **Caprimulgus europæus**, L. The Nightjar.

OBSERVERS.—W. P. Curtis and E. H. Curtis. TIME.—
DATE.—June, 1915. SEX.—
PLACE.—Canford Bottom, Poole. DURATION.—

FOOD.—As above explained we were unable by reason of the habits of this bird to secure satisfactory records, but examination of the remains in and about the nesting site showed the following species:—*Triphaena* (*Agrotis*) *pronuba*, *Agrotis* (*Feltia*) *exclamationis*, *Agrotis* (*Euxoa*) *tritici*, *Agrotis* (*Lycophotia*) *porphyrea*, *Leucania pallens*, *Xylophasia* (*Parasticthis*) *monoglypha* (*polydon*), *X.* (*P.*) *lithoxylea*, besides many other *Noctuae* which we could not identify.

OBSERVERS.—W. P. Curtis and E. H. Curtis. TIME.—
DATE.—July 16th, 1916. SEX.—
PLACE.—Canford Bottom, Poole. DURATION.—

FOOD.—We had two nests under observation. ♀ no. 1 was missing and her eggs were addled shortly after they were laid. ♀ no. 2 hatched off about 8th July. On 16th ♀ no. 2 and both nestlings were missing, but the crops of both nestlings were in the nest, and contained a large number of moths. I identified *Leucania pallens*, *X.* (*P.*) *lithoxylea* and *X.* (*P.*) *monoglypha*, but regretfully came to the conclusion that I could not spare time to mount the whole contents for microscopic examination. The preceding note needs amplification from the ornithological point of view. We had a nest of the Sparrow Hawk, *Accipiter nisus*, 300 yards away. Up to this date it had contained five hungry little fiends, the last of which left on or about this date, but all of which were being attended by their parents. On missing the nightjars we searched the nest of *A. nisus* and found feathers of an adult (sex not determined) and two wings of nestlings. I record the above but do not propose to refer further to this aspect of the matter, as the problem under discussion is wide enough without bringing the coloration of Aves in.

29. **Cuculus canorus.** The Cuckoo.

OBSERVER.—W. P. Curtis. TIME.—All day.
DATE.—Early August, 1916. SEX.—?
PLACE.—Arish Mell, Dorset. DURATION.—Casual.

FOOD.—A number of Cuckoos, collected at this place preparatory to migration, seemed to me to make a regular practise of eating *Zygaena filipendulae* at rest and in copula. There were countless thousands and larvæ; but it is inexpedient to carry field glasses (if you value them) on the Dorset coast.

Observer.—E. H. Curtis. Time.—Afternoon.
Date.—July 23rd, 1916. Sex.—? Two birds.
Place.—Badbury Rings, Dorset. Duration.—Casual.

Food.—The larvæ of *Zygaena filipendulae*, watched with glasses. E.H.C. thinks this result discounts my observation recorded above, but I give it because the birds did take something from high on the grass stems where the *Z. filipendulae* were sitting.

Evidence of attack not sufficiently detailed to be given above.

Victim.—*Triphaena* (*Agrotis*) *pronuba*. Date.—July 26th, 1913.
Place.—Morden Decoy, Dorset. Observer.—W. P. Curtis.

Particulars.—Four wings on a pathway. Possibly attacked by a bat or a nightjar, and probably on the wing.

Victim.—Green Aphides. Date.—July 20th, 1913.
Place.—Parkstone, Dorset. Observer.—Frank Hudson.

Particulars.—Watched a finch (species ?) for twenty minutes taking aphides from the underside of plum leaves.

Victim.—*Pyrameis atalanta*. Date.—September 22nd, 1913.
Place.—Poole. Observer.—W. P. Curtis.

Particulars.—About 9 a.m. two forewings lying on a wet pavement, but both dry and uninjured except at the base. ? bird.

Victim.—*Hibernia marginaria*. Date.—March, 1914.
Place.—Bere Wood, Dorset. Observer.—W. P. Curtis.

Particulars.—Four wings lying in the ride. Either bat or bird.

Victim.—*Dichonia areola*. Date.—April 9th, 1916.
Place.—Dunyeat's Hill, Poole. Observer.—W. P. Curtis.

Particulars.—Four wings lying at the foot of an oak. Quaere bird; quaere attacked at rest.

30. **Falco tinnunculus.** The Kestrel.

We spent two Sundays, of twelve hours on the first occasion and eight on the second, on a pair of these birds feeding young, but the only food identified with any degree of certainty was the Meadow Pipit, *Anthus pratensis*, and the long tailed Field Mouse, *Mus sylvaticus*. No insect food of any description appeared to be brought to the nest.

On May 14th, 1916, I examined a quantity of castings of a kestrel, which contained innumerable remains of many species of beetles, but I could see nothing Lepidopterous about the castings.

In early August, 1916, at Arish Mell, Dorset, I saw six kestrels at work every day for ten days, on the Downs in the neighbourhood, catching *Melanargia galathea*, *Argynnis aglaia*, *Epinephele ianira*, and other common Lepidoptera, but it will be patent that I could keep no account.

31. **Larus ridibundus**, L. The Blackheaded Gull.

Observer.—W. P. Curtis. Time.—5.30 p.m.
Date.—July 31st, 1913. Sex.—(?) About 20 individuals.
Place.—Poole. Duration.—At intervals for one hour.

Food.—Winged individuals of ants, which were swarming.

This is the evidence we have collected, and though it is not as complete or as precise as either my brother or I had hoped, it has taught us the extreme difficulty of this line of observation, and it has also taught us that in order to get really good results one wants to be able to devote one's entire attention to it, to the exclusion of every other activity, for a long period.

Notes on the Coleophoridæ.

By Hy. J. TURNER, F.E.S.

Coleophora paripennella.

These notes, which were made some years ago, have been awaiting an opportunity to continue, when other matter might not be too pressing at the moment.

My first experience with this species was through the kindness of my friend Mr. A. Sich, who sent me several cases containing living larvæ from Lausanne, on the shores of Lake Geneva, where he had met with them on rose in September. For a time the larvæ fed quite well on a small-leaved form of the garden rose, but I failed to rear them, as convenience for the hibernation of the cases with full fed larvæ was not at hand, and they will not take to any position except what is practically a natural one in the open.

The cases were apparently a very flattened tube when the larvæ were young, if one may judge from the anal end of the full sized case, to which additions were made coincident with the gradual growth of the larva, by the attachment at first of very small pieces of leaf laid around the mouth opening one over the other, except on the underside, which was strongly keeled. The tube gradually increased in diameter and about midway the portions of attached leaves were very much in a series of strong flounces directed somewhat backwards. The pieces attached around the mouth opening of the full-sized case are not so large and irregular as those which preceed and are situated in about the middle third of the tube. The keel is quite straight from the anal end to the mouth opening, and a strip of the case along each side of the keel is very smooth, the smoothest part of the case, and of a lighter brown colour than the rest of the case. The keel is in line with the joined edges of the two valves of the anal opening, and is continued again for a short distance on the back of the case, in line with the upper suture of anal valves. This is the appearance of the case in the autumn, but probably spring-found cases may be more uniform, the projecting portions of leaf particles having worn off during the rigours of the winter exposure on fence or tree-trunk.

At the meeting of the South London Entomological Society, in September of the following year, Mr. Sich exhibited half a dozen cases with their living larvæ of *C. paripennella*, which he had met with at Barnes, feeding on sloe. They were of different sizes, one or two being very small, while others were of considerable growth. It was not until midday on September 15th that I was able to look closely at them, when a most curious circumstance attracted my attention to one case. From the mouth opening of this particular case protruded the head and two or three of the following segments of a larva, and it seemed as if the case was slightly constricting the body of the larva and not quite of sufficient calibre to comfortably contain it. At the other end of this case, the anal end with the two valves, were to be seen another pair of jaws and a portion of the head of a larva, apparently working at enlarging or adjusting. I watched for several minutes and saw one pair of legs protrude in addition. In a short time the valves closed, and then I noted that the larva at the other end was getting uneasy and struggling to extricate himself from the case, an act which it was apparent was a difficult one. I suppose that the larva seen at the anal end, when it had finished its work there, had turned round in the case and was endeavouring to push out the larva at the fore end. For a considerable time, some half an hour, this struggle went on, the larva at the fore end, which I take was the intruder, gradually withdrawing its body, until when only the last two or three segments remained in the case, I could see below the semitransparent rim of the mouth opening, the jaws of what I take to be the rightful owner. At last the ejection was completed and the intruder was got rid of, the remaining larva putting out its jaws and head presumably in triumph. I examined the larva ejected and could not find any traces of bites, nor was there the least amount of moisture, which would undoubtedly have been present if in the struggle the skin had been ruptured. The larvæ were now put on one side until about 8.30 p.m., when I noted that the triumphant larva had carried off its house and was feeding as usual. The second larva, the ejected one, had not entered the empty case, but was lying near it, rather sluggish, but otherwise did not appear any the worse. With care I at last succeeded in introducing the anal extremity of the ejected larva into the empty case, and then gradually worked the whole larva backwards into it. Upon looking at it again about 11 p.m., I found that larva also was busily engaged in making up for its fast of the last few hours.

I do not know at all how to account for this occurrence. What made the intruding larva go into a neighbour's case? It would not go voluntarily into its own case, although it lay a long time on it, and yet it entered the wrong case and that really too small for it. The larva which retained the case was evidently the rightful owner of it, as he seemed quite at home. Probably he was finishing off an enlargement, since the anal valves were being pushed open, their edges were being worked on, so that they should fit properly. At the same time I noticed that the margin of the mouth opening was semitransparent and not of full consistency, and there were numerous marks of freshness about the case. The other larva was certainly not the owner, as the case was too small for him and he was ill at ease and only able to extricate himself with difficulty. Yet he must have gone in at the mouth opening and not only gone in but gone in head first and then turned round inside. Besides, the only empty case and the case into which I finally pushed him and which he retained, was quite suitable as to size, and presumably the one he had quitted at the first.

I found that the larvæ of this species feed readily on leaves of garden rose. In fact they are naturalised in my garden at the present time, and reappear each year.

COLEOPHORA LUTIPENNELLA.

A number of the light brown cases of this species were taken on oak leaves at Bookham early in the month of June. The larvæ were feeding both on the upper and the undersides of the leaves, and were in their last skin. They were of a bright yellow orange colour with very black shields and plates. On the back of the first thoracic segment the plate was practically continuous all over except for a partial suture in the middle line towards the rear. The second segment had two small round spot plates, or two well-developed oblong median sized plates situated towards the back edge. The third segment had no plates. On the sides of these segments were: 1st segment, a spot plate; 2nd segment, a dot plate; 3rd segment no trace of a plate. On the back of the anal segment was a very small plate, which appeared to be situated near the tip of the end of the body because of the unusually small size of the segment compared with those adjoining it.*

These larvæ were extremely restless and when spun up remained but a few days in pupa. The imagines began to emerge on June 22nd and continued to come out until July 11th.

The following year, on May 18th, the Rev. G. H. Raynor sent me a number of cases from Hazeleigh, the larvæ feeding on oak. Several of the cases looked very strange. The larvæ had recently abandoned their old dwellings and were enclosed in brand new cases. One side of each case was from the upper epidermis of the leaf and was darkish brown in colour, while the other side of the case was from the lower epidermis and was of a whitish or at any rate of a much lighter colour. Age and weathering soon assimilates the two sides and we get an almost uniformly tinted case. One larva made an error and bit out pieces too wide to form a uniformly tubular case, with the result that the dwelling was awkwardly shaped, not unlike the "belly" portion of a fiddle.

Erebia zapateri, Obth. Notes on early stages, etc. (*With two plates.*)

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

[The following was written some five years ago (and has been in type since), as an appendix to a paper by Mr. H. E. Page, on *E. zapateri* in the field and in the cabinet, and in comparison with *E. neoridas*. Mr. Page has, so far not completed the paper.]

Towards the end of August, 1912, I received from Mr. H. E. Page three eggs of *Erebia zapateri*, which had been laid at Bronchales about August 14th-16th.

The rough sketches annexed will give some general idea of the egg. It is of a usual *Erebia* pattern, width 0·9mm., height 1·1mm., with 14 ribs, which are rounded, with rather deep hollows between. The secondary (horizontal) ribs are faint in most lights, and most easily seen on the slopes of the primary ones. They are about 24 in number, they fail at the top where the primary ribs break up into nodules and network, and below, where the primaries fade into the slightly rounded base. They exist, therefore, along about 0·9mm. of the height of the egg. The actual flat base of the egg is about 0·7mm. across. The egg is widest about 0·35mm. from the base, and it narrows thence upwards to about 0·65mm. at the top of the primary ribs.

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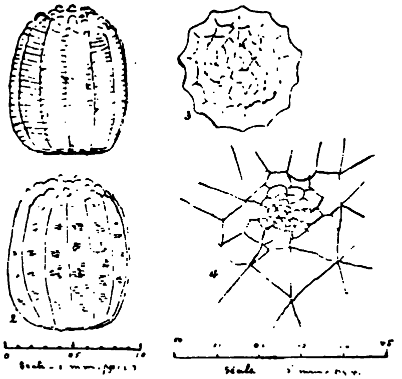
* I think the plates, together with the general colour of the larvæ, might form a basis for the specific distinction of the larvæ. I have a few rough sketches of these, and so far have found various points of distinction.—ALFRED SICH.

The nodulated and netted top is comparatively flat, and the micropylar area is in a shallow central hollow. In colour the egg is whitish, but has about five dark spots in each hollow between the ribs, they are not very regular in disposition, size, or outline, each consisting of an aggregation of a number of very small spots. Similar spots occur on the top, one occupying the micropylar hollow, the others are smaller than the lateral ones, they are not very regularly placed and look a little ragged from their constituent dots not being very closely aggregated. This description applies to two of the eggs, a third looks darker, the spots being larger in this one, and one of the ribs does not reach so high as the others.



Camera sketches of egg. Fig. 1 shows ribbing and general form; Fig. 2 gives something of the size and disposition of the dark markings; Fig. 3 shows the knots and ribbing of the summit; and Fig. 4 the arrangement of cells in the micropylar area.

On August 29th, the larvæ within having become well-developed, the eggs are of a somewhat uniform pale leaden tint, except that the ribs stand out white (really colourless), the contents having left them vacant.

The larvæ hatched on August 31st. During and just after hatching the larvæ eat the whole of the egg-shell.

The newly hatched larva is about 1·5mm. long, of a pale leaden ochreous colour, the head brighter, almost yellow, about 0·75mm. across, the body being about 0·5mm. The head (figs. 7 and 8) is very rounded, has a very fine sculpturing, in fact much resembling that on some Lycaenid eggs, the hollows very irregular in shape and arrangement, but of nearly uniform size, something rather less than 0·02mm. in diameter. There are on the head some hairs, five or six being visible on either side on a front view. These are longer, straighter, and smoother than those on the body (about 0·04mm.), more like ordinary hairs, but a little curved. On or near the clypeus, however, they are longer (0·1mm.) and more numerous, two hairs being towards the apex of the clypeus. On the cranium they are a little clubbed and well-serrated. The skin of the larva is rough with fine points; there are the usual tubercles on the abdomen, of the two subspiraculars the anterior is much the lowest. The tubercles have raised, almost globular, or urn-shaped, bases, with a dark ring at the top. The hairs themselves are extremely short (about 0·025mm. to 0·04mm.), transparent, rather clubbed, and with short spicules or serrations (fig. 6), they are longer posteriorly.

One larva was sacrificed in order to obtain some portions of the egg-shell, the other two took very kindly to *Poa annua*, and fed on it apparently willingly and contentedly. They were remarkably sluggish in habits, and on any disturbance readily dropped, and remained motionless, somewhat contracted, but quite straight, *i.e.*, with no tendency to curl up.

On September 29th they appeared to be full-grown in the first instar, though still eating a little. They are now 5·0mm. in length, a little slender for a Satyrid, but the head, ridiculously large on hatching, now seems of proper proportions, the thickest part of the body (about 3rd or 4th abdominal segment) is about twice the diameter of the head (say 1·0mm.), a little less when the larva is stretched out.

The larva is longitudinally striped, Satyrid fashion, the colouring consisting of numerous dots, which appear to be largely coincident with the skin spicules or roughnesses. The ground colour is a greenish-white, the dots of a deep chocolate-brown. There is a broad lateral band almost free of dots, which has under a hand lens an appearance of being smooth and porcellanous, but with higher magnification is seen to be spiculated as elsewhere, it reaches up so as almost to include the spiracles.

The chocolate dots are massed or run together into a sort of labyrinthine arabesque, when the colour forms apparent longitudinal bands. Below the lateral line the ground colour and dots are of about equal amount, giving a tolerably uniform tint.

There is a dark dorsal line in which the ground colour is lost by continuous chocolate, between this and the spiracle, the upper, larger portion has a considerable sprinkling of brown, which is perhaps less abundant close to the dorsal line, giving it a lighter margin, but is concentrated at a line two-thirds down it. The lower, rather smaller, portion just above and including the spiracles, has a larger proportion of brown than the area above it, so as to form a darker band, of which the lower sixth and upper half are darkest, so as to leave a paler, but still well-coloured, line or band between them.

The hairs (i, ii, iii, iv, v) in usual places are conspicuous under magnification, as small, curved, colourless and glistening, somewhat clubbed and serrated rather than spiculate. On the front of prothorax are two hairs on conjoined base, in line with iii. Second and 3rd thoracic segments have hairs in line with i and ii, both on the 4th subsegment, a third on the same subsegment rather above line of iii, and a fourth at about the level of the spiracles on following segments. The abdominal segments are divided dorsally into five subsegments, of which the two anterior, rather wider ones, form one group, and the three posterior another, so that they might be described as two subsegments, subdivided into respectively two and three subsidiary ones.

The tubercles are situated, i on the 1st, ii on the 4th, and iii on the 2nd, lower down the subsegments, anastomose so as to defy exact naming.

The ocelli form conspicuous black marks on the head. The ocelli are four on each side, a large and small one together some distance from the antennæ, and two not close together against the base of the antennæ. There is a circle still higher than the first two, that is, or represents a fifth, but it wants the definite dark margin of the others. The jaws have a smooth, sharp, chisel, cutting edge and no teeth or serrations. The spiracles are brown, the first and last are nearly twice as large as the others. The hairs are longer posteriorly on the 9th abdominal segment, iii is short, but i and ii are nearly 0·1mm. long. The 10th abdominal segment has a large anal plate on which are hairs 0·15mm. long. These look like i and ii, and iv along the posterior margin of the plate, which is itself 0·2mm. across. There are several hairs behind this, but no definite tails as are common in Satyrid larvæ. The true legs are ochreous. Associated with each proleg is a hair of ordinary type, *i.e.*, without serrations and nearly straight, and about 0·07mm. long. The prolegs each possess six equal crochets about 0·05mm. long. The claspers have ten similar crochets each.

These two larvæ died about the middle of October, I fancy because I did not afford them suitable conditions for hibernation.

DESCRIPTION OF PLATES.

Plate X.—Fig. 5.—Larva half grown in first instar, or a little older, photographed by Mr. Tonge, ×10. Sluggish as the larvæ are, Mr. Tonge found them very bad sitters, as the exposure to a good light at once led them to seek shade. The point of view brings the broad lateral subspiracular band a little above the middle of the figure, and brings the legs well into view. The subsegmentation is very distinct, but the stripes on the upper part of the larva do not appear.

Fig. 6.—Portion of larva skin with hair ×400. Photo. by Mr. F. N. Clark.

Fig. 7.—The head by transmitted, Fig. 8, by direct light × 50.

Plate XI.—Fig. 9.—Male appendages of *E. zapateri* × 25.

Fig. 10.—Male appendages of *E. neoridas* × 25.

The British Psychides.

By Rev. C. R. N. BURROWS, F.E.S.

The beginning of July brings near the conclusion of the Psychid season of 1917, and I am called upon to give an account of my failures and successes. I have worked hard and carefully, anxious to learn all I could. I have been rather disappointed at the small response which my appeal for material has met with ; but considering the state of the world, and perhaps also in a measure the unpopularity of this group of Lepidoptera, I have received doubtless as much encouragement as I had a right to expect. But to those kind and capable observers who have given me their assistance I offer my sincere thanks.

Perhaps in arranging my notes it will be better to follow the order observed in my preliminary paper, published in the *Entomologist's Record* for April last. But I must first of all thank Dr. Chapman for his remarks upon that paper. I had noted in my list the correction of the name *opacella*, H.S., to *atra*, L., but retained the former as more familiar to British collectors, who are still I fancy a little bit upset by frequent changes in nomenclature. It would appear also that I was too modest. I should have stated that the whole of the material which I can gather together will, all being well, be deposited in the National Collection, with that which Dr. Chapman has generously placed at my disposal.

Now to this year's investigation. As I remarked above, I have been somewhat disappointed at the results of my appeal. But from my correspondents, capable observers as I have said, I gather that the *Psychides* are not so generally distributed as I had supposed. Several have written me, "We find none of them hereabouts." There may be some sort of "art" or "skill" in "spotting" the cases, especially of those species which are more successfully concealed, but all the same I am disposed to think that my various collecting localities, widely separated as they have been by time and place, have been more favoured than the country generally.

Narycia monilifera, Geoff. I watched carefully for the appearance of these cases upon tree-trunks in the spring, but saw no trace of them until June 7th, when I found three. On June 10th I found a pair of imagines in copula in my garden, and have from time to time found further single specimens. As they may be expected to be about until the end of July, there is still plenty of time to look for them. The imagines emerge about noon, are very inactive during the day-time, though very quick to skip away when disturbed, if they have a chance. The natural flight time appears to be at dusk. I netted a male on June 21st. I have satisfied myself that the species is not ordinarily parthenogenetic.

Diplodoma herminata, Geoff. My experiences with this insect have again been curious. As I reported before, the cases which I gathered in May and June last year, yielded their imagines (indoors) in March, and they continued to emerge until May 19th. When I examined the unemerged cases I found that the majority had died as larvæ or pupæ, but there was still one living larva. I found a male resting on a tree-trunk on June 20th, this year, at 11.0 a.m., and the same day began to find once more the large, probably "full-fed," cases, which I suppose, from previous experience, are to produce next year's imagines. The unfertilised ova of this species do not ordinarily hatch, so far as I have observed. I am now finding occasionally a small, light-coloured, trigonal case, measuring 5·1 × 3mm., resembling a truncated case of *Taleporia tubulosa*, which species is, of course, by now full grown and emerged. I have placed these cases with my *D. herminata*, and believe that the larvæ are constructing the outer case which is peculiar to this insect. They may be really the first or second year's larvæ.

Solenobia inconspicuella, Stainton. I visited my old Brentwood locality on April 4th, much earlier than I have been there of late years, accompanied by Mr. F. G. Whittle, and two lads who had been previously instructed as to what they were to seek. We gathered about two dozen cases (size 5 × 2mm.) which we supposed to be the species of which we were in search. *These cases produced nothing but mildew*, and I can only infer that they were those of *S. inconspicuella* from former experiences. Mr. Whittle visited the place later, on May 1st, and kindly sent me his "bag." *Again nothing but mildew*. I gathered from my local posts, from March 23rd, a number of cases which, as last year, closely resembled the Brentwood cases (even to the occasional development of the white heart-shaped mark), but these also produced no imago. But these Mucking cases produced, in due course, a large number of minute larvæ, some of which are still living and feeding on tree-lichen and dead insects. These cases having been taken wild and no imago having been seen, makes the evidence for parthenogenesis in this case somewhat doubtful. I am extremely disappointed that I have not secured fresh material of this species, and that no one has been able to supply it.

S. lichenella, L. As to this species, for which I instituted a vigorous search, I am left at present in the greatest doubt. I have come across two very distinct forms, either of which may be the insect.

First, Mr. Whittle found and forwarded to me from May 2nd a number of cases more or less trigonal, 8 × 3·5mm. in measurement, smooth, pale brown in colour, which he had found upon a very rotten post on the Thames marshes. These cases produced females only, which promptly commenced to lay into the case itself, the empty pupa shell, as always in *Solenobia*, projecting from the opening. These eggs produced larvæ on June 6th, which are still alive and very vigorous, feeding upon the lichen (rotten wood ?) and dead insects. This species is undoubtedly parthenogenetic. The other form which I have found is still crawling up posts alongside the railway line here at Mucking. This case, 6 × 2·5mm. in size, which I have also found on the tree-trunks, is almost flattened, the appearance being produced by a flange of lichen around the edge of the case, which is applied flat to the supporting surface. The opening of the case is parallel to the lower surface, and therefore applied to the support. These cases, to my intense disappointment, have produced nothing to repay my care. They seem to go off quickly when imprisoned, whatever care be taken of them. Opening a number which I considered to be dead, I found one packed with empty egg shells (no pupa shell), some with dead larvæ, and quite a number with larvæ and pupæ of a small ichneumon. Nothing else has emerged. Which of these two is to be considered to represent *S. lichenella* I am at a loss to know. The measurement of the case given by Tutt is 5-6 × 1·5mm., which scarcely agrees with either of my captures. Nor can I divine which the other case represents, unless it produces something lepidopterous.

Yet another *Solenobia* case has been sent to me by Mr. Whittle, from Rannoch. He found the cases upon lichen on rocks. The case is wonderfully like that which I assign to *S. inconspicuella*. These produced only females, the first of which bears date May 24th. The cases measure 5·6 × 2·5mm. From these there hatched on June 13th, a large number of young larvæ, which I doubt not will be impossible to rear, though they are at present feeding upon Mucking tree-lichen. One cannot help wondering which this *Solenobia* can be, whether one of the *inconspicuella* group, or some new species. But unless the Scottish climate keeps them back they are far too late for most known species.

Taleporia tubulosa. I have again been unfortunate with this species. It is quite evidently not common, here I have had one brought in from palings near by, but it had the pupa skin projecting. All others sent me have been empty. I had a rather strange experience with this species. The ova of *Fumea casta* (?), which I secured from Mucking females (2) last year, produced a number of larvæ which, as I remarked above, came to nothing, but amongst them were a number of undoubted *tubulosa*! These last actually outlived the *casta*, but are I fear now all defunct. They seemed to enjoy damp, dead foliage, and spent their lives down underneath it, whence, of course, it is possible that some

[illegible]

[illegible] Thanks to the kindness of the Rev. F. E. [illegible] I have had two consignments of larvæ of this species. [illegible] system of [illegible] them [illegible] off, die and wither. I have [illegible] of rearing anything, so heavy has been the fatality— [illegible] the appearance of a female yesterday (July 2nd). I [illegible] for males in my interest. These [illegible] when travelling by post and at other times for [illegible] the pattern on their cases.

[illegible] These cases are now in their prime. [illegible] posts and palings where suitable [illegible] they appear to prefer a certain state of [illegible] in the [illegible] they reside. The cases, generally ringed, curved, [illegible] very often longitudinally, fragments of rubbish, [illegible] like the preceding species, and their [illegible] conspicuous. It will be remembered that the [illegible] and the activity were remarked upon by Stephens [illegible] the species. These larvæ also leave their cases [illegible] when confined, and [illegible] at night also when they redecorate [illegible].

[illegible], nor as far as I know *Masonia*, have come my way. Mr. [illegible] sent me a case of *P. [illegible]*, but it contained only an empty pupa case.

[illegible], Pallas. I have had a limited number of samples sent to me from different localities. Chiefly I am indebted to Mr. G. C. Griffiths of Bristol for a further supply of the cases from rocks in his neighbourhood. Of this form (or species) I reared quite a number from the egg, and many of these emerged this year. All these, tame and [illegible], are now set and off the boards, and Mr. Griffiths reports that the insects in their native haunts are now over. I also reared a limited number from eggs sent to me from the New Forest by Mr. Whittle. These also are all out, at which I make no remark because they have been reared indoors all their lives.

But the Mucking specimens taken wild are only just appearing, the first male as a matter of fact emerged this morning (July 3rd). There is perhaps a suggestion here that there is specific difference. I was able to make two experiments, which are I think worth recording, with the earlier emerging insects. I paired a New Forest male with a Bristol female. The pairing lasted the normal period (about four minutes). After some time I opened the case and found a few shrivelled eggs, evidently never living. I managed also to effect the opposite pairing, a Bristol male with a New Forest female, and in this case there were no eggs at all! In both instances the pairing was perfectly natural. There was no hesitation whatever, and the actions of oviposition were performed as though all were correct. Knowing the habits and peculiarities of these insects, the inference seems to be that the species are not the same. I regret that I have not been able to secure a pairing between the Mucking race and the others, but it has so far been impossible.

I have not received any *casta* material from Scotland, Ireland, or Wales.

In examining Dr. Chapman's *casta* material, chiefly Continental, I have found one species whose genitalia are very marked. One of these is a dealer's specimen and bears the label *nitidella*. There are a few others which bear the same name but have not the same genitalia. I had hoped, and still hope, to find this species amongst British material, but it is evident that I shall have to seek it further afield. I hope that friends will remember this, and spare me even single specimens of the male from as many localities as possible.

A few further remarks may be allowable. Most of the insects under consideration are very delicate organisms. I have repeatedly found that cases collected by children, and the inexpert, fail to produce imagines and prove on examination to be dead. This is undoubtedly the result of rough treatment in removing them from their support, squeezing, or pinching. The cases should therefore, on no account be touched with the fingers, but removed from their support with the blade of a knife, or carefully with the edge of the collecting box.

Most of the species are notable cannibals. It has been no surprise to me to find cases in confinement with quite large holes eaten in the sides and the contents removed. This also occurs when in the wild state. I have seen *Fumea casta* deliberately attack and devour the cases of its brethren (not the straws) and the contents down to the last fragment. The sharp withdrawal of the larva when alarmed, the quick jerking of the case, are doubtless protective measures, and I should suppose that only when the individual is enfeebled, or attacked from the side of its abode can the carnivorous passion be practised.

The difficulty of determining the different cases from descriptions I find to be insuperable. They may be clear enough, but when I have a number before me I confess that I can make nothing of them. Of one thing I am certain, that colour, and even material, are of little value as points of distinction. The cases of lichen feeders naturally have the colour of the material which their inhabitants are using, when fresh, but when dry I presume the colour is all but entirely lost. My *casta* bred in confinement from the egg, scarcely touched the carefully chopped material provided for them, but chose to use nibbled paper or dead leaves. Again, there is considerable variation in shape, especially in *Solenobia*, when some cases are more evidently trigonal, others cylindrical. In any case, the preserved cases, dried and shrunk, bear but little resemblance to the original appearance.

I fear my results are so far poor and inconclusive. They are published with the earnest desire to interest, and may be enlist, collectors.

The Upper Engadine in 1914.

By Hy. J. TURNER, F.E.S.

(*Concluded from Vol. xxviii., page 155.*)

Pressure of other matter has again and again prevented the completion of these notes.

August 11th.—My note-book says "a grand day" so far as weather was concerned, but "nothing done" and "getting very dry," are further comments I made, together with the record that "insects were scarce." This is a locality where changes are very sudden and where spring and summer and autumn are apparently crowded into about two months. Things rapidly come out, reach their full and as rapidly decline and disappear. Why I should not see a single *Papilio machaon* and only two *Parnassius apollo* I am unable even to guess. I find that the late Mr. A. E. Gibbs, who was at St. Moritz for several weeks at this date in 1913, took both species freely in exactly the same spots as those over which I worked, and where I had met with them in 1907.

On August 12th the sun was at first bright at intervals. We collected on the Rosatch slopes, but the day gradually got more dull until thunder and rain put a stop to our ramble. *Argynnis niobe* and *Erebia melampus* were still common, and the females of *E. tyndarus* were now at their full in numbers, among them being several of rich brown underside of lower wings with strong black transverse lines. *Pieris rapae* was just coming out in a fresh brood (2nd) and *P. brassicae* was abundant. *Plebeius aegon* and *Polyommatus icarus* were settled on the stems and heads of various plants, the former in much greater predominance, the latter very few in number. *Plusia gamma* occasionally turned up, but not in any number. Beyond these few species practically nothing was to be obtained.

On August 13th, in the morning, a new walk to us was taken, *viz.*, to Crestalta, the beautiful elevated rock overlooking the Lakes of Silvaplana and Campfer, returning by the sheltered path under the cliff on the edge of the latter lake. In the afternoon we took the winding path to the new settlement of Chanterelle on Alp Laret, and then on to the Ober-Alpina. Blues, mainly *Plebeius aegon*, were settling on the spots already in shade. *Cidaria verberata*, *Larentia caesiata* and *Lygdia populata* were obtainable in quantity when stirred out. *Botys aerealis* and *Thamnonoma brunneata* were noted. Females of *Coenonympha satyrion* were sitting in number among the blues, some examples of a very light ground on the underside at the outer margin. The white band of the underside showed through very plainly on the upperside as a light shade.

August 14th.—My notes say it was "now late summer." The brilliancy of the flowers seemed gone and they were few and far between, with the consequent scarcity of insects. Many things seen were now much worn, and the only new species in number was *Erebia goante*, which was very local, only being met with on a new road leading to the Alpina above the upper Campfer road, where an exposed rock face was now rarely passed without finding several specimens resting on it, as very conspicuous, but very shy, objects. Moths of the genus *Gnophos* were to be disturbed from most overhanging banks. I met with an odd specimen of *Heodes virgaureae* which was very small. In 1913 the late Mr. A. E. Gibbs took a number of this species here, all of them being of a small race. My specimen has elongated spots on the underside of the forewings. What flower-heads there were were mostly tenanted by one or more Noctuid moths, mostly *Agrotis cuprea* and *A. alpestris*. Among them was a solitary *Charaeas graminis*, a species one would have expected to find in abundance. Probably a search at dusk would have met with numbers flying low over the grass. I met with a curious occurrence to-day on the path returning from Alp Laret. In front of me I noticed a moth tumbling over and over on the path in a most erratic way with much vigour. On boxing it, to my astonishment, I found that one of the wood-ants (*Formica rufa?*) had securely fixed itself to a specimen of *Plusia gamma*, which was making these frantic efforts to free itself from its aggressor. *P. gamma* must have been very much asleep and the ant very much awake for such a capture to be so successfully carried out.

August 15th.—Daily visits to the Consul to see if news or arrangements for our return had come through, precluded any long expeditions even if the absence of travelling facilities had not also prevented. During this period I think we went into every corner within easy reach of St. Moritz, and tried every path around. We visited the Suvretta road again viâ Alp Laret. A female of *Argynnis niobe*, the form with silver spots on the underside, was taken, certainly quite rare here, where almost invariably only var. *eris* is met with. A few *Anaitis paludata* were obtainable. Somehow or other we could not come across the spot for *Zygaena achilleae*, as only occasional odd specimens were taken. *Agriades coridon* was probably the most abundant butterfly now, but never in the quantities that one meets with the species at the famous Royston locality in Hertfordshire. The ground of the undersides of both fore- and hindwings of the males was very pale with very indefinite markings, and the undersides of the forewings of the females were also pale in ground colour. *Brenthis pales* was pretty well over, and most other things were sparse in numbers and worn in condition. The afternoon turned dull with a very wet night succeeding it.

August 16th.—Except for an hour in the morning this was a "terribly wet day," says my notes. This enforced inaction threw us back on to our thoughts of home. Our finances were exhausted. Communications were apparently "cut," for no news from home came through. Papers were practically absent, and visitors were slipping away day by day, while we waited and waited but did not "see." To the rain succeeded snow and bitter cold. Twenty-four hours of incessant fall, till the whole place looked lovely as a sight, but cheerless and depressing to the wanderers stranded far from home.

The morning of August 17th seemed to give indications of a break in the weather, and at eleven o'clock the sun shone brightly. By the afternoon all the lower snow areas had melted, and in a walk along the roads we saw the following species which had successfully weathered the rain and snow and had not succumbed to the very "cold snap," *Argynnis niobe*, *A. aglaia*, *Erebia goante*, *E. tyndarus*, *E. melampus*, *Pieris brassicae*, *Hesperia alveus !*, *Aricia medon*, and the usual common moths. Every place in the sun was hot and steamy. The evenings now got very cool after the sun went below the mountains, probably cooler on the village side of the valley than the opposite side, which faced the declining sun for a much longer time in the afternoon.

August 19th was showery. I took a pair of *Argynnis aglaia* flying *in cop.* The female carried the male. They remained united for more than twenty-four hours. *Erebia goante* was also taken *in cop.*, the female carrying the male in flight. In my previous notes I have omitted to record two other species of *Erebia* taken when flying *in cop.*, *viz.*, *E. tyndarus* and *E. melampus* in both of which the Satyrid habit was confirmed of the female carrying the male. In the sunny intervals I worked at the *Erebia goante* spot. There were only males up to this date. The specimens were very invariable in depth of colour and markings. The bands were in width and shape very uniform. In all the specimens the apical eye spot on the forewing was a double one and well developed, and the spot in the anal angle also was present in every specimen with only trivial variation in size and development.

But the spot midway between these was much more inconstant in size. In about 50% this spot was reduced to a dot without a pupil. In about 30% it was absent or with only a trace. There was very little and only slight asymmetry. On the hindwings there were always three well developed eye-spots with the exception of two examples, both of which had an additional spot above the other three. The spotting of the undersides was in every case a replica of the upperside. A few, very few, *E. euryale* were noted among the *E. goante*, they assumed the habit of settling on the perpendicular face of the rock through which the new road had been cut. This face was considerably elevated above the general level of the valley, and was exposed to the full sun towards the south-east. The butterflies came from the pine clad slopes below in ones and twos at a time, rarely were more than three seen at one time, and only when the sun was clearly shining.

August 19th was quite an autumn morning in the feel of the air. Intermittent gleams of sunshine allowed a little collecting, but our minds were getting more uneasy day by day as the "news," such as it was, became more depressing. The eyebright *Euphrasia* was now a common flower, although both flowers and insects were becoming few and scarce, a small number of favoured spots excepted. Has any one ever of late years seen Pontresina without its stream of visitors on a bright sunny day in summer? We walked over in the afternoon and saw only half a dozen with scarcely as many natives. The beautiful place was deserted, shops shut, hotels boarded up, all closed and deserted. One seemed lost, and with a last look up the beautiful Rosegg Thal, with its head embosomed in the glorious sunlit snow fields, we turned for our walk back adown the street, across the meadows and the stream, across the railway, through the pinewoods, along the road by the Statzer See and St. Moritz Lakes by the Switzerhoff and St. Moritz Station, to our diggings, longing, I must say, for our home and friends. Nothing fresh had turned up entomologically. There was an abundance of moths on the tree-trunks and among the undergrowth. *Larentia caesiata*, *Lygdia populata*, Gnophids, two species of plume, *Scopariae*, *Aphelia osseana* were in abundance. Most species were very wary, an approach of ten or twelve feet was quite sufficient to disturb them from their resting places, whether tree-trunks, rocks, or undergrowth. *Gnophos tenebraria*, one of the largest species of the genus, was obtainable, chiefly females now, usually disturbed from overhanging tufts of grass, and *Plusia gamma*, odd specimens, but never seen more than about two or three per day. *Cidaria verberata* could also be taken in small numbers.

August 20th.—To-day I found the haunt of *Aricia donzelii*, among the younger pine trees clothing the slopes above the footpath running through them towards Campfer. The males were plentiful sitting on the plants of *Geranium pratense*, which grew plentifully at this spot, and quite near the *E. goante* rocks. I took a solitary *Aglais urticae*, in fact I saw no other traces of this usually, at any rate in the larval stage, abundant butterfly, nor were there nettles sufficient to attract the females on oviposition bent. *Agriades coridon* still hung on, and the pretty *Anaitis paludata*, a close relative of our *A. plagiata*, was quite common. In the afternoon we went toward Celerina and took a steep path on the mountain slopes leading to the quarries. Here the usual resting species were common, but in a meadow with uncut patches of growth, we still noticed var. *chrysocephala* of *Adscita geryon* on the grass and centaury heads. A strong bed of a large species of thistle produced a goodly number of the brilliant Coleopteron *Cetonia aurata*, which had nearly buried themselves in the large heads of flowers and fluffy seeds, often two or three specimens together in a capitulum. The weather became dull and threatened for rain so we went across the mouth of the tunnel to the exit of the Innfall ravine, up which we walked back to the village. Although this gorge afforded plenty of shelter for insects we never found more than odd specimems of any species along that path.

The next two days, August 21st and 22nd, were dull and largely taken up with worries. No definite news from home, the British Consul could get nothing satisfactory as to our return, which was still problematical, finances were nil, in fact worse than nil. The latter item however was satisfactorily met for the hotel ("Westend") proprietor acted quite handsomely, he not only reduced our "pension" without changing our accommodation, but lent us small change gratis, and told us that we need not trouble to pay him when we left, but could send to him after we had reached home. I am pleased to be able to express our gratitude to Herr Runger for his kind and practical sympathy at a time when to my own knowledge other visitors in the village were not only in dire straits but in absolute want of food. However we were relieved financially by the consideration of the home authorities and were able to obtain from the Consul a sum sufficient for our daily wants and for our subsequent return home. *Aricia donzelii* could be swept in fair numbers from the Geranium plants or found hidden under the foliage by diligent search, but they are very difficult to see. Among them appeared a very small *Erebia melampus*, which was just the size of the males of *A. donzelii*. On the 21st I saw a specimen of *Pyrameis cardui* but failed to catch it, no other was seen. At this date I was struck by the abundance of the sheep's bit, *Jasione montana*, which attracted the day-flying Lepidoptera to some extent. The brilliant *Trollius europaeus* was found to-day for the first time. It does not seem to be at all a common plant in this district.

August 23rd.—On this day I took the first *Issoria lathonia*. On several occasions I had a suspicion of this species, when a rapid flying Argynnid went by with an unusual gleam of silver, but only at this late date did an opportunity to capture one occur. A belated male of *Colias palaeno* was also noted in that part of the Alpina where it occurs sparsely apparently each year. A very worn female of *Aricia eumedon* was taken. This species seems very scarce here. A few *Agriades thetis* were still lingering on the flower heads, but quite passé. The females of *Aricia donzelii* were now well out. A few *Charaeas graminis* were taken. The form from this place seems quite different to one I have taken in England. Its markings are comparatively wanting in clean definition and appear "woolly," if I may so apply the term. There is no strong contrast of the shades as in many English specimens. *Polyommatus damon* and *P. eros* were still obtainable, the former was never in abundance. The dark form of *Urbicola comma* could be taken sparsely, such a contrast to the brilliant examples one gets from Royston. Worn specimens of *Erebia epiphron* were occasionally picked up, probably blown down from the higher levels, for the habitats of [illegible] the species in the Grisons are at a higher level compared with their habitats in the rest of the Alps. The form taken may be called var. [illegible], I suppose, more obscure in markings and definition than the type. [illegible] was in some numbers, of a form with more suffused and uniform clothing and with much less definite markings than in specimens taken in our English pine woods. I was much struck with the sun effects on the coloration of the Hesperids that were sitting on flower and seed heads in the late afternoon. My rough note says "sunshine through," and "all colours." The effect was very beautiful, one could hardly suppose that it was possible to get such a varied colour effect and combination from the action of the light on the dull initial elements of Hesperid colour.

On August 24th, we took advantage of a beautiful autumn day to go again to the Haanen See. It was a solitary walk, not a visitor to be met anywhere, either going or returning. We felt our solitude, we were left behind, and apparently all were gone. A steady walk up the sharp gradients of the Johannisberg brought us to the Hahnen See Restaurant (summer), now deserted, 7070 ft. above sea level, and just above the tree zone, which is higher here than in most parts of Switzerland. Insects of course were few. A much belated *Latiorina orbitulus* on its restricted habitat another 100 feet higher up, an odd example of *Zygaena exulans* whose rendezvous I could not find, a number of *Coenonympha satyrion* mostly ab. *unicolor* with a specimen of what one might call ab. *unicolor-obsoleta*, in which the eye-spots on the underside of the hindwings were absent except for a small dot, the remnant of the spot at the anal angle; the eyespot at the apex of the wing being the only full sized representative of the usual row. Here, too, an odd example of *Colias palaeno* was taken and several *E. epiphron* var. *nelamus*. Instead of returning by the same path we came, as on previous occasions, another longer way indicated in our Bædeker was chosen. This led by much less sharp gradients along the western slopes of Piz Rosatsch across several screes to the remarkable huge mass of broken rocks at the back of the Kurhaus and Stahlbad Hotel, down which we descended to St. Moritz bad.

August 25th. Still waiting, waiting. No definite news of home, no arrangement for return, it was difficult to appease one's mind for the future. As it turned out this was the last day of our collecting. We actually discovered a walk new to us, through the Statzer Alp, the woods on the mountain slopes at the back of St. Moritz Lake and Statzer See. Here wood-cutting had commenced and the paths were frequently obstructed by the fallen pines. Lepidoptera were conspicuously few in numbers and our desires were few for I had heard by an odd English paper that had got through that I should have been at my duties a fortnight previously. However, things were moving, and at dinner that evening a message from the British Consul told us to be ready to move in a day or two.

August 26th, was spent in getting ready, for we (there were nine English remaining) had been informed that we must go to Berne. There were apparently jealousies between the various consuls; and tickets, etc., for us had been "thrown into the waste paper basket," because the British authorities did not give the arrangements for our return to one of them to carry out.

August 27th saw us early aboard one of the very few only trains now available for passengers, and by evening, after various ticket troubles at Zurich, etc., we were in comfortable quarters in Berne.

August 28th.—Ten o'clock sharp saw us at the office of the organiser of the British trains, a most courteous gentleman. To my statement of our business, he doubted his ability to find room for us as the two succeeding daily trains, the last, were already made up, and then he put into my hands an astounding telegram from the British Consul at St. Moritz, stating that we had given up all hopes of the government's scheme of return, and had decided to go on our own to Geneva. Why this deliberate mistatement was sent after we had left St. Moritz with the full knowledge and advice of the Consul of all we had done and were going to do, I do not know. However, "alls well that ends well," the representative himself set to work, not leaving anything to his assistants, and secured us seats in the already over-full train which was starting early the next morning, the 29th. I can only add that the British authorities were particularly happy in their choice of Mr. Skipworth, for the arrangements right throughout the three days' journey home were admirable, and carried out without a hitch, in spite of the inconveniences inherent in a long journey. The rest of the day was spent in revising our knowledge of the beauties of the fine old city of Berne, and in a visit to the Exhibition of the year now destined to be a failure.

August 29th saw us up betimes and with our allotted and numbered seat in the train we started at last, our good friend the organiser coming down to the station to bid us *bon voyage*. Second class carriages, corridor train, with 857 aboard bound for Geneva, we sped rapidly across the watershed, the high plateau where Freibourg stands between the Rhine basin and that of the Rhone, down towards the lake of Geneva, with the glorious mountains of Savoy in front, we reached the city from which the lake gets its name. Here we find that we have to change the Swiss train for a French train and that we are virtually prisoners. We pass out into the station yard in numbered order, pass into the other end of the station to be scrutinised by a double row of smiling French soldiers who perfunctorily examine the one hand-bag of moderate proportions each was allowed to carry, on into a numbered seat in the French train. Some of us I fear were much increased in bulk by bulging pockets, and by receptacles hung on various "coigns of vantage," the latter mainly containing rations of which we were advised to carry sufficient for several days. No one was allowed to leave the platform but the Swiss boy scouts were at our disposal, and most helpful they proved themselves to the old and infirm, and useful in getting food and refreshment for those who wished, refusing all gratuity. On again to Bellegarde, the custom-house station. No trouble this time, again smiling French officials and cheers of welcome. Well on in the evening we entered the station of Lyons. What a scene! The whole of the station, platforms and permanent way, was filled from end to end with people, cheering, singing, waving flags. A trained choir sang the Marseillaise, some fine soloists added their quota, the British National Anthem was sung, and every traveller was decorated with a small tricolor by enthusiastic maidens. Three Indian gentlemen were discovered in one of the carriages and had a great ovation. Such a scene of scenes one can never forget. After an hour and a half of this we entrained again and passed away into the night. Several stoppages were made before sleep overtook us. At one place I remember the country people held their little children up to the carriage windows to be kissed. Morning broke and we were well on our way towards Paris. About midday the train stopped for more than an hour at the large station of a town of which I have forgotten the name. At first we were asked not to leave the carriages as a train of "blessés" was expected. It came and pulled up beside our own. Straight from the battlefield around Luneville it bore heaps of wounded lying on straw on the floors of luggage vans in the hot sun. Not much "glory" in this aspect of war! But this is not entomology. What occurred on the homeward journey would fill several numbers of our magazine. Train after train similarly filled passed, long stops at stations give opportunities for food raids even into the streets and shops, "Fontainebleau en Avon" on a station name-board brings back thoughts of collecting, arrival in Paris brings another scene of enthusiastic welcome and change of train, a swift journey to the coast within a score of miles of the German advance, the night spent on the deck of the channel steamer 1100 on board plus multitudes of super-aggressive mosquitos, the morning crossing in the mist with thoughts of mine and submarine, the feeling at the sight of the "white cliffs" of Britain, the rush for the train on landing, the welcome home, all crowd into our minds as the unforeseen ending of our last "holiday abroad."

SCIENTIFIC NOTES AND OBSERVATIONS.

Paired Dryas paphia in flight.—During the first three days of this month I came across the following cases of *D. paphia* flying paired, at Lyndhurst: July 1st, 1 pair ♂ carrying ♀; July 2nd, 3 pairs ♂ carrying ♀ and 1 pair ♀ carrying ♂; July 3rd, 2 pairs ♂ carrying ♀ and 1 pair ♀ carrying ♂. This experience upsets all one's theories as to the invariability of habit in any given species. It is quite impossible for me to have been mistaken, as in both cases where the ♀ carried the ♂ I followed them up, saw them settle two or three times on brambles, close enough to be able to start them flying again with my hand, and in both instances the ♀ carried the ♂ every time. Nor was either a case of a worn and feeble ♂, both pairs consisted of insects in prime condition; on the other hand in one of the cases where the ♂ (as is usual) carried the ♀, the former had lost a considerable part of the left forewing, which did not, however, seem to affect its flight. In every case I saw, the carrying partner, of whichever sex, sat at rest with the wings expanded. I saw one pair only of *Limenitis sibylla* in flight, and as it was impossible to see which carried the other, I caught them with the view to seeing them start in flight from the net, but unfortunately they separated immediately on capture.—George Wheeler, 37, Gloucester Place, W. 1.

NOTES ON COLLECTING, Etc.

Field notes from Bath and the neighbourhood.—My entomological senses were first gladdened this year (1917) on March 17th by seeing a real live moth on the wing. It was a well-marked specimen of *Cheimatophila (Tortricodes) hyemana*, flying in a wood at Conkwell, Wiltshire. It made a warm impression on me after the long dreary winter. This is the only Wilts locality I shall mention, all the other localities to be named are in Somerset. In the beginning of April a larva of *Coleophora lineolea* was seen mining *Ballota nigra*, the plant, as usual, growing under a hedge. This was near Bath, and higher up the hill, on a stone wall, two small holes were seen newly covered. On opening these two larvæ of *Bryophila perla* were discovered. On the 6th two ♂ s of *Alsophila aescularia* were seen partly wrapped round some iron rails. There are few fences here, stone walls or rails being mostly used, and the stone walls are very unproductive. I have searched in vain for cases of Psychids. About this time I paid the first visit to a rough down behind the church at Bathford, and noted its good entomological appearance, but the only thing then noted was the ubiquitous *Coleophora laricella*, in its winter cases.

On the 8th, *Hibernia marginaria* was seen on a beech trunk beside the canal, at Limply Stoke. At this time we were still getting almost daily snow showers. April 24th was the first really bright warm day. I took the tram to Bathford and went up the down. On a beech at the foot of the down were two *Chimabache fagella*, a light and a rather dark one. *Aglais urticae*, *Vanessa io*, and Tiger-beetles (*Cicindela*) were seen on the wing. Two days later the larva of *Coleophora albitarsella* occurred on its usual food-plant. Bathford was again visited on May 5th, and the first *Elachista rufocinerea* was noted. *Coleophora gryphipennella* was at work on the rose leaves and, on the down above, it was pleasant to watch several *Ancylis comptana* flying over the turf. Some small reddish larvæ were found mining the leaves of *Helianthemum*. They mined out the whole leaflet, which then appeared white, and were probably the larvæ of *Laverna miscella*. The next day *Selenia bilunaria* was brought to me, and the day after the first *Celastrina argiolus* were seen on an ivy-covered wall at Bathwick. On May 8th, *Herbula* (*Pyrausta*) *cespitalis* was boxed off the short turf near the Hampton Rocks. This is another good-looking locality, with a wood below it. It was strange about this time to see the almond and apple in bloom at the same time, as in most years the former is over long before the latter is in blossom. On the 11th *Pieris rapae* was well on the wing, and *P. brassicae* was also about. At Conkwell a good specimen of *Drepana cultraria* was picked up out of the canal, and was quite lively on being rescued and placed at the foot of a neighbouring beech tree. *Heliozela stanniella* occurred on oak in the wood. At this time *Cemiostoma laburnella* was observed in Queen Square, Bath. On the 4th I went to Bathford and found that May had come in, as I saw many *Pancalia leuwenhoekella* skipping over the turf, and *Adela viridella* was on the wing. *Hesperia malvae* and *Nisoniades tages* were also both common, and *Hipocrita jacobaeae* was dashing about in its wild way. The calendar of the entomologist and botanist does not always coincide with that of the astronomer. On the 19th *Adaina microdactyla*, *Adela rufimitrella*, and *Coleophora murinipennella* were boxed from the old canal bed at Midford. Here grows the great dock with sedges, *Eupatorium*, *Inula* and colt's foot; the ground looks promising but is not of great extent. On the 25th Bathford was revisited, and *Callophrys rubi* was noted. I took *Micropteryx thunbergella* and some *Elachista bedellella*. These small grey moths were difficult to see in my net, which is not so white as it once was. *Elachista argentella* was easy to see sitting on the grass stems. The next day, at Conkwell, *Euchloë cardamines* put in an appearance, a few were seen in the lanes and meadows. *Brenthis selene* and many *Micropteryx calthella* were observed. On the 28th *Pararge megera* was on the wing as well as *Gonepteryx rhamni* and *V. io*, while *Epiblema brunnichiana* was abundant at Midford, where the pretty little *Ancylis lundana* was also present. At this time many pale greenish Tortricid larvæ were observed hanging from wych elm. Two of these taken produced later, as was expected, *Cydia trimaculana*, Don. On the 30th a company of *Elachista nigrella* was found flying over a grassy bank in a lane near Bath, about 5.20 (G. T.), on my return after an hour none were to be seen. There are a great many limes around here, but I have only seen one *Smerinthus tiliae*, which was hanging to a rail in the Victoria Park. Queen Square in the town contains a few thorns and other trees. It is a haunt of *Endrosis lacteella*, on one occasion five were resting on one tree. *Laverna hellerella*, *Œcophora augustella*, *Tinea cloacella*, *Hepialus lupulinus*, and *Enarmonia woeberiana* also make use of the Square, and here I found, strange to say, the only *Swammerdammia pyrella* that I have seen this year. There are plenty of thorn hedges all round the country. Near the pretty village of Combe Hay *Swammerdammia combinella* was boxed off sloe, on June 7th, and the first *Polyommatus icarus* were seen at rest in a meadow. At Bathford the next day *Adsita geryon* was abundant, and a few *Laverna miscella* were swept from *Helianthemum*. When in the net, with their wings closed, they look very linear, and the raised scales of the forewings add to their odd appearance. One *Elachista cinereopunctella* raised my hopes of getting a series, but I found no more. From a nut bush, half way up the down, I netted *Lithocolletis nicellii*. In some of the meadows here *Rhinanthus* grows plentifully, and I have seen one or two *Perizoma* (*Emmelesia*) *albulata*. In one field on the bank of the Avon, at Saltford, *Hepialus humuli* was so plentiful about 9 p.m. (G.T.) that it almost made an upper stratum to the grass. Bathford again on the 13th, rather a windy afternoon, the bag consisted of one *Stephensia brunnichiella* and four *Elachista triatomea*. The latter were sitting on the grass and appeared like small editions of *E. argentella*, which was also present. One *Adela fibulella* was noted. The next day, near Bathampton, a worn specimen of *Asthena blomeri* was boxed and liberated. On the 18th I walked to Midford and saw on the road the first *Aricia medon* (*astrarche*), many *Stenoptilia pterodactyla* (*fuscus*) on the wing and one larva of *Marasmarcha lunaedactyla* (*phaeodactyla*) on rest harrow. At Midford the first *Epinephele jurtina* was seen. The next day I took an evening walk in the lanes around Combe Hay, moths were abundant, but the chief feature was the quantity of that exquisite Lepidopteron *Alucita pentadactyla*. A walk was taken in the evening of the 21st through some meadows and lanes near Bath Easton, a specimen of *Scythropia crataegella* was taken, and in one of the narrow lanes, with hedges on both sides, *Scopula oliralis* occurred at almost every yard. On the 23rd I went by tram to Combe Down and thence to Conkwell, over the meadows and lanes. In Somerset I took two dark specimens of *Argyrotoxa conwayana* and mines of *Lithocolletis fagella*, as I am in want of a good series of this very common moth! *Xanthosetia hamana* was seen among thistles. In Wilts, at the top of Conkwell Wood, where there is a fine sunny corner with numerous wild plants, I swept a specimen of *Pacalia leuwenhoekella* and found a nest of some Phycitid on a young Turkey Oak. Nearly the whole bush was rolled into balls of leaves. A few pupæ were taken. On the way out of the wood a stem of *Hypericum* was gathered containing seven mines of *Nepticula septembrella*. This species also occurs at Pope's Lane, on Combe Down, Somerset. In both counties this day *Tortrix viridana* and *A. conwayana* were continually getting into the net, while *Prays curtisellus* was not rare, both of the type and var. *rustica*. The next day was devoted to "Jupiter pluvius," and I only saw *Lozotaenia unifasciana*. The following day being fairly sunny a few things had come out to dry themselves, and among others, sitting on the leaves in the hedges at Combe Down, were noticed several *Sericoris lacunana*, *Cnephasia incertana*, and one *Notocelia* (*Aspis*) *udmanniana*. June 26th was fairly fine, so Bathford was tried again. The down was a beautiful sight, large patches of *Helianthemum* and *Lotus carniculatus* in full blossom, with graceful tufts of *Avena pratensis* growing along the rough track. Very little, however, was on the wing. I swept several net-fulls of flies and beetles and then was astonished to see a clearwing in the net. It proved to be *Sesia ichneumoniformis*, in good condition, afterwards I took one *Scythris fuscocuprea*. The burnets, of which I had previously seen many larvæ and pupæ, were just appearing, and three *Zygaena lonicerae* were noticed. Here and there one came across a number of the larvæ of *Hipocrita jacobaeae* and the sparse remains of a ragwort plant almost eaten to the roots. Numbers of these caterpillars must starve. To the left of the down is a wood, and some spruce firs with one or two Scotch pines and larches overhang the wall that encloses. Shaking these into the net I obtained some Tortricids and a few *Batrachedra pinicolella*. These look very like a fragment of brown pine needle when, with closed wings, they sit in the bottom of the net. One *Blastotere* also fell into the net, and this I think is *B. glabratella*, but it is still on the setting board. The next day, along the canal near Bath, *Cemiostoma scitella* was boxed and some mines and pupæ of *Acrolepia granitella* were found on *Inula*, close to the water. This will nearly close my June observations, and though most of the species mentioned are quite common, I have noted them because I do not remember ever reading any account of the Lepidoptera of this district. Stainton constantly mentions Bristol in the *Manual*, but Bath seems to have escaped the attention of the entomologist, nor have I come across anyone with a net here. After the last few years, when even common things have been less numerous than formerly, it is pleasant to see them in some abundance, and it is always an agreeable experience to become acquainted in the field with species one has previously only collected in the neighbourhood of Covent Garden. Getting them there, however, is of great use, as it enables one to recognise them when one happily meets them for the first time alive.—ALFRED SICH. *June 29th*, 1917.

NOTES ON ENTOMOLOGY, ETC., IN ENGLAND IN 1917.—The following notes were written as I had opportunity amidst the vicissitudes of camp life during the great war, in the neighbourhood of the Aisne Barracks, Blackdown Camp, Hampshire.

At first sight the country around here seems rather forbidding for general Entomology as it is mainly covered by fir and pine trees with large masses of heather, much of which more or less recently has been burnt. There is also a certain amount of bog-land. The rest consists of camps and rifle ranges connected by roads and ways much knocked about by traffic of all descriptions connected with the war. Thus it seems obvious that only the closest observation can wrest Nature's secrets from her here.

April 23rd.—To-day, while walking from Blackdown Camp to Camberley across Chobham Ridges, I noticed several magpies and a jay. The early moth, *Brephos parthenias*, frequently settled on the upper branches of the birch, which was not yet in leaf. The day was fine, but the prevalance of clouds no doubt prevented me from observing more than a solitary hybernated *Aglais urticae*.

April 29th.—Fine and sunny. The hybernated females of *Gonepteryx rhamni* were flying over the heather amid the fir-trees to the right of Chobham Ridges, as though looking for the buckthorn, a by no means common shrub in this neighbourhood. I succeeded in killing a female of *B. parthenias* with the knob of my stick, without damaging it, as it rested for a few moments on the ground.

May 5th.—Fine but very gusty. I walked across Chobham Ridges towards Windlesham, and in a copse near that village I obtained five examples of *Pieris napi*, all just emerged, and also a quite fresh example of *Ematurga atomaria* on the heath. I saw a male of *Euchloë cardamines* and some hybernated males of *G. rhamni*. There were also a few specimens of the Tiger Beetle, *Cicindela campestris*, which later on was quite common in this neighbourhood.

May 6th.—Another fine day but very windy. Walking to Bagshot Heath by Heatherstone Corner, bird-life appeared very busy and I noticed several magpies, whose silence now spoke of nesting and egg-laying. Jays, wood-pigeons, crows, chaffinches, yellow-hammers, and one brambling, all appeared very busy with domestic matters, with a couple of red-legged partridges on Chobham Ridges on the way home, all lent colour to a walk otherwise uninteresting owing to an almost total absence of insect life on the wing.

May 13th.—A settled fine day. Again walking to Bagshot in the afternoon across the Heath from Chobham Ridges I found the tiger beetle, *C. campestris*, now quite abundant. The males of *P. brassicae* (spring brood) were on the wing in some quantity in the wooded glades of the Heath, whilst hybernated females of *G. rhamni* were careering wildly over the open heather as *G. cleopatra* does over the Mediterranean heath at Hyérès. The swift flying *Anarta myrtilli* was in some numbers, whilst I noted three males of *Saturnia pavonia* flying wildly as is their wont. The *Andrena* bees are common on Bagshot Heath, and I have taken several to-day.

May 20th.—The last few days have been sunless with much rain, and the trees are now rushing into foliage, and growth is everywhere apparent. In many damp spots around, the cuckoo-flower, *Cardamine pratensis*, is in full flower, and on this *Euchloë cardamines* has been busy ovipositing.

May 23rd.—I was glad to see *Callophrys rubi* out to-day in the bright sunshine settling on the newest fircones, where capture is easy. The females of *Ematurga atomaria* are fairly common on the open heath, and *Bupalus piniaria*, fresh out, is settling on the fir-trunks just outside the camp.

May 26th.—Walking to-day along the Chobham Ridges towards the "Jolly Farmer," I noted freshly emerged examples of *Spilosoma* *menthastri* clinging to the long grass, and at the same time representatives of the spring brood of *Rumicia phlaeas*. The males of *E. cardamines* were now quite common on Bagshot Heath, and in wooded corners *C. rubi* were numerous. On a solitary holly-bush I found a female of *C. argiolus* ovipositing. The males of *Brenthis euphrosyne* were just beginning to appear, so also were males of *Coenonympha pamphilus*, especially on the open heather-covered areas. *Hesperia malvae* was flitting along its circumscribed haunts. No doubt one could obtain many more species in this kind of country if there were more opportunity than one gets during camp life in war time.

May 28th.—To-day there was hot sun with strong wind. Whit Monday, so unlike itself in pre-war times, yet came out royally for the naturalist. Away across Chobham Ridges, past the "Jolly Farmer," and across the wide stretch of Bagshot Heath, I found, in a sheltered glade, a huge laurel bush in full flower, intergrown with a large rhododendron, which gave the best collecting for perhaps miles around. Here were flies enough to satisfy the most ardent dipterist as to numbers, whilst *A. myrtilli* literally "swarmed" at the laurel flowers. *Brenthis euphrosyne* occasionally came to feed, and I was fortunate to pick out three fine fresh specimens of the clearwing *Aegeria culiciformis*. On the way back the males of *S. pavonia* were much in evidence, although not disposed to be caught. *Pararge megera* males of the spring brood have been out for the past week in the railway cutting at Frimley Green, and to-day I saw them on Chobham Ridges, close to Heatherstone Corner.

May 30th.—To-day *Euchelia jacobaeae* was on the wing in fresh beauty and in abundance, and the females of *C. pamphilus* were out, whilst males of *Polyommatus icarus* were also abundant; all observed between Frimley Green and the Aisne Barracks.

June 3rd.—The weather to-day was not conducive to seeing insects on the wing, but on revisiting the two intergrown bushes on Bagshot Heath I was pleased to still find *A. myrtilli* in good numbers, and many in first-rate condition. I also took three more *A. culiciformis* together with a number of Diptera, especially species of *Syrphidae*. In the fir-woods there were plenty of females of *Bupalus piniaria*. The chalk carpet *Ortholitha bipunctaria* has become numerous among birch and bracken whilst *Euclidia mi* came to the flowers of the laurel. In spite of the few short intervals of sunshine I had a fair day's collecting.

June 4th.—I was interested to-day to see *C. pamphilus*, *R. phlaeas*, *P. brassicae*, *P. megera*, *Euclidia mi* and *P. rapae* all flying together in the midday sun almost within the camp lines.

June 9th.—To-day was too thundery for much success, but *Diacrisia sannio* (*russula*) was beginning to emerge on Bagshot Heath and I secured one male.

June 10th.—Just past the "Jolly Farmer," to-day, on a high rhododendron bush in full flower, on the way to Bagshot Heath, I was surprised to see an exotic *Papilio* on the wing. After much patience I secured it. Its flight was rapid and it never really settled on the flowers although it seemed highly attracted to them. It was apparently freshly emerged by the condition of its scaling, but had got somewhat ragged. I have had no opportunity as yet to identify it.

June 17th.—To-day I have been collecting on Bagshot Heath.

D. sannio was well out and I obtained a nice series. The heat was however very great and the flies most aggressive.

June 18th.—On the same ground to-day I found the males of *Augiades sylvanus* had come out in numbers, and I came across one male of *Aphantopus hyperantus* flitting along a short lane near the "Jolly Farmer." This last record seems an early date for the species. The females of *D. sannio* were fresh out to-day, and I took half a dozen, but if missed at the first stroke they seem to have a series of clever subterfuges to evade capture afterwards.

This concludes my short notes on collecting in England in 1917, but as I leave for France on June 26th, I hope to send later on if opportunity occur, "Notes on collecting Lepidoptera in France in 1917."—E. B. Ashby, Bulstrode Rd, Hounslow.

CURRENT NOTES AND SHORT NOTICES.

Three publications have reached us from the Province of Nova Scotia, sent out by "order of the Legislature." They consist of Bulletin No. 8, entitled, *The Apple Maggot in Nova Scotia*; Bulletin No. 9, *The Green Apple Bug in Nova Scotia*, both by W. H. Brittain, Provincial Entomologist, and *The Proceedings of the Entomological Society of Nova Scotia* for 1916, No. 2, which contains an account of the year's activities mainly devoted to economic entomology of which a consideration of the pests of the apple has formed a major portion. The entomological work in Nova Scotia has been carried on as a separate branch of the Provincial Department of Agriculture for the past four years. The need for systematic entomological work had become increasingly apparent owing to the great value of the fruit industry and the damage sustained from the attacks of insects, which was further emphasised by the discovery of two new (to Nova Scotia) and destructive insect enemies, *viz.*, the Brown-tail, *Euproctis chrysorrhœa*, and the San José Scale, *Aspidiotus perniciosus*. At the present time W. H. Brittain has charge of this sub-department, and under various legislative enactments he is enabled to systematise and carry out his work. This falls under several definite headings. 1. Inspection. All imported nursery stock has to enter at definite ports, is subjected to inspection and fumigation, and can only be imported during two months in spring and two in autumn. Farm and field examination takes place frequently, with immediate and drastic action if necessary. 2. Investigation. Several laboratories have been established for definite investigations as to the life-histories of the pests, and as to the value to be attached to the parasitic controls and insecticides. 3. Education. The teaching of Entomology at the Agricultural College, in the local Science Schools, and even in the fields has been commenced. 4. Collections. A representative collection of Nova Scotian insects has been begun, and will grow as soon as systematic collecting is taken up. 5. Apiary Inspection. An epidemic of "Foul Brood" has recently necessitated the passing of an Act of Legislature, and to carry this out a specialist has been appointed particularly to take up an educational campaign. 6. General. Correspondence is carried on with all parts, specimens examined and commented on, advice given, and the public are invited to make the fullest use possible of the information at the disposal of the department. The two special pamphlets referred to above are illustrated by coloured and other plates and diagrams, and contain 56 and 70 pages respectively of detailed matter on the life-history, statistics of damage, and the use of controls.

Parts iii. and iv. of the *Transactions of the Entomological Society of London* contains thirteen papers with thirty-four plates, some of which are coloured. Dr. Chapman contributes four papers. xii. "The Rein-sheath in Plebeiid Blues, a correction of and addition to paper vi.," with five plates. xiii. "Resting attitudes in some Lepidoptera, examples of recapitulation in habit," with a plate of diagrams to show attitudes of Lepidoptera at and after expansion of wings (we had the pleasure of seeing a specimen of *P. rapae* go through its curious posturing while in Dr. Chapman's study a short time ago). xiv, "*Micropteryx* entitled to ordinal rank; Order ZEUGLOPTERA," with twelve plates. xv. "The Evolution of the Habits of the larva of *Lycaena arion*, L." Dr. Cockayne contributes three papers. xvi. "Gynandromorphous Lepidoptera," with twelve plates, dealing with two gynandromorphs of *Amorpha populi* and one of *Amorpha hybridus*, with a discussion of a "Theory of Origin of Halved Gynandromorphs." xvii. "The Relation between the Secondary Sexual Characters and the Gonads and Accessory sexual Glands in Insects." xviii. "An Intersex of *Amorpha populi*." Prof. E. B. Poulton communicated a paper by H. Ling Roth. xix. "Observations on the Growth and Habits of the Stick Insect *Carausius morosus*; intended as a contribution towards a knowledge of variation in an organism which reproduces itself by the parthenogenetic method," with numerous diagrams. xx. "Falkland Island Diptera," by C. G. Lamb, with diagrams. xxi. "Parthenogenesis amongst the Workers of the Cape Honey-Bee," by Rupert W. Jack, with two plates. xxii. "On the Factors which determine the Cocoon Colour of *Plusia moneta* and other Lepidoptera," by Mrs. O. A. M. Hawkes, communicated by Dr. Imms. xxiii. "On a collection of Heliconine forms from French Guiana," by J. J. Joicey and W. J. Kaye, with two coloured plates, deals with a new phase of variation. xxiv. "Further Notes on the Jurinian Genera of Hymenoptera," by the Rev. F. D. Morice and John Hartley Durrant, is well worth consulting for the remarks on "emendations" in the spelling of names, and as one of the authors is an eminent classical scholar, the severe condemnation of such "misapplication of learning" should carry some weight.

The *Canadian Ent.* for May, among other matters, contains (1) "Notes on the Black Apple Leaf-hopper (*Idiocerus fitchi*)"; (2) An account of the "Collections of the Entomological Society of Ontario"; (3) A discussion on "Seasonal Irregularities in the Occurrence of Dragonflies," by E. M. Walker, which concludes with the following points, (a) Certain species of dragonflies are much more abundant in certain localities during warm seasons than during cold seasons, (b) The abundance is probably not due to the emergence of large numbers of individuals from their breeding-places, but to the greater activity of flight in warm weather, whereby the insects are dispersed to localities not visited in cooler seasons, and (c) The Odonate fauna of a restricted locality contains a large percentage of transient resident species and stragglers from other localities, such species varying greatly from year to year; and (4) "An Interesting Case of Instinct," of which the following paragraph is a summary.

The writer noticed a small branch of Sumach which had been used as a dwelling by a number of Hymenoptera and which had been opened at several points by a woodpecker. Subsequently to these operations, and in spite of the precarious condition of the stem, opened at several points, another Hymenopteron thought it still serviceable and turned it into a nest for its progeny. One cell was built at the bottom of the excavated channel, a piece of resin formed the floor, and a transverse partition of the same substance the ceiling. The rest of that portion of the tunnel up to the orifice bored by the woodpecker was left unoccupied. A stopper of resin was then placed just below the level of this opening, a second in the orifice itself and a third above it. In the tunnel above this the bee constructed several cells, but again did not make use of the whole length below the next orifice made by the woodpecker. A straight resin stopper was placed just below this second orifice. The writer concludes with the following quotation from Fenton, "*Ann. Soc. Ent. Fr.*," 1901, "With Hymenoptera, acts of intelligence are exceptional; often those which seem such are nothing else than its manifestations of a habit but seldom remarked."

Among the agricultural pests in the western continent but few seem to give more trouble than those which have been unknowingly imported from Europe. In two *Bulletins* received from the New York Agricultural Experiment Station entitled respectively, *The Leaf-weevil* (*Polydrusus impressifrons*) and *Plant-lice Injurious to Apple Orchards*, Prof. P. J. Parrott and his coadjutors discuss the life-history and possible controls of four of these immigrants. Most of the experiments detailed in these reports are on the use of various insecticides. Only in the case of the weevil has the possible control of its natural enemy, the only one so far discovered, *viz.*, the Braconid *Diospilus polydrusi*, been considered.

The *Ent. Mo. Mag.* for May concludes an interesting article on "The Rarity and Restricted Distribution of Insect Species," by G. B. Walsh, B.Sc. The writer sums up the various factors in the problem as follow:—

1. Rareness, consists of—
    a. Paucity in numbers. *b*. Restriction of range or habitat.
2. Rareness due to—
    a. Phylogenetic Factors.
        (1) Distributional origin.
        (2) Gradually increasing range.
        (3) Gradually decreasing range.
        (4) Evolution of new forms.
        (5) Relation to other organisms.
        (6) Past geological history.
        (7) Difference in migrational paths.
        (8) Exceptional means of distribution.
        (9) Change of physiographical and climatic conditions.
    b. Ontogenetic Factors. (Almost invariably fundamentally climatic).
        (1) Unfavourably on the organism.
        (2) Unfavourably on its food supply.
        (3) Favourably on its enemies.

In the May number of the *Ent. Mo. Mag.*, Mr. D. Sharp discusses the British species of the *Bagoini* group of the *Rhynchophora*. He proposes and describes the new genus *Probagous*, to contain a species new to science discovered and taken very rarely in the New Forest, and which he also describes under the name *Probagous heasleri*. With *P. heasleri* the older species known as *Bagous cnemerythrus* (*tempestivus*) has been included. Two further new species have been added by Mr. Sharp to the genus *Bagous*, *viz.*, *B. tomlini*, examples of which were found by our colleague, Mr. Tomlin, in the Romney Marshes many years ago, and *B. arduus*, from a single specimen in the possession of himself. Both are closely allied to *B. claudicans*.

In the *Irish Nat.* for June, our colleague Mr. H. Donisthorpe contributes an article on the Coleopteron, "*Elater praeustus* an Irish Beetle." The species was taken by Mr. Donisthorpe and his friend Mr. F. Bouskell in June, 1902, at Glencar, Co. Kerry, and recorded in the *Ent. Rec.*, xiv., 240 (1902), as *E. pomonae*. The Irish race differs considerably from examples of the typical *E. praeustus*, the latter being larger, duller, and more closely and strongly punctured, and having a broad black tip to the elytra.

The *Entomologist* for June contains some suggestive notes on the Spanish race of *Papilio podalirius* (the race *feisthamelii*), and on the distribution and development of the *Melanargia* species in the South-western Palæarctic region, by Mr. H. Rowland Brown, and a Report on British Orthoptera in 1916, by Mr. W. J. Lucas.

It is with much regret that we have to record the death of Mr. A. J. Scollick, of Merton, for many years a member of the S. London Society. Although not a regular attendant at the ordinary meetings of the Society, he came to most of the field-meetings, where he was ever welcome for his genial manner and pleasant companionship. He was a field-worker and took pleasure in the lanes and woods he loved so well. During the past year he had been staying at Seaton for his health, where he passed away after an operation.

SOCIETIES.

The Entomological Society of London.

February 7th, 1917.—Nomination of Vice-Presidents.—The President announced that he had nominated Dr. T. A. Chapman, Dr. G. B. Longstaff and the Honble. N. Charles Rothschild as Vice-Presidents for the ensuing year.

Death of a former President.—The President also announced the death of Mr. C. O. Waterhouse, a former President of the Society, and a vote of condolence with his daughter was passed on the motion of Mr. Champion seconded by Mr. Bethune-Baker.

Election of a Fellow.—Mr. A. W. Rymer Roberts, M.A., Rothamsted Agricultural Experiment Station, Harpenden, and The Common, Windermere, was elected a Fellow of the Society.

Lepidoptera from Salonica.—Mr. A. H. Jones exhibited on behalf of Captain E. F. Studd, R.F.A., a Fellow of the Society, at present serving with the British Expeditionary Force at Salonica, various Lepidoptera taken by him in 1916, in the neighbourhood of Salonica.

Commander Walker said that he had taken almost all the species exhibited many years ago in the neighbourhood of Port Baklar near the Boulair Lines. He had found the larvæ of *M. trivia* feeding on *Verbascum* in the greatest abundance.

The President and Mr. W. G. Sheldon commented on the abundance of butterflies in Macedonia, the latter observing also that North Macedonia and Albania were among the least known of European localities for Lepidoptera.

Local forms of Agrias claudia.—Mr. G. Talbot exhibited on behalf of Mr. J. J. Joicey a series of *Agrias claudia*, Schulz, showing its distribution and local forms. These include the forms *sahlkei*, Honr., *claudia*, Schulz, and *amazonica*, all from St. Jean de Maroni, French Guiana.

Some British Rhopalocera.—Dr. E. A. Cockayne exhibited :—

(1) A series of *Pararge egeria*, bred November and December, 1916, and January, 1917, from ova laid by several females taken in August, at Limber, N. Lincolnshire.

(2) An aberration of *Polygonia c-album*, the hindwings being nearly black and the forewings with costal spots united into a crescent.

(3) Two partial gynandromorphs of *Polyommatus icarus*.

(4) A female *Agriades coridon* with one hindwing marked with blue like ab. *semisyngrapha*, the other hindwing having only a thin sprinkling of blue scales over the same area; taken at Royston, August, 1916.

Mr. Bacot read a further note dealing with the question of the specific identity of *Pediculus capitis* and *Pediculus humanus* (*vestimenti*).

Special Meeting.—The special Meeting summoned to consider the new Bye-law proposed by the Council was then held.

The Secretary read the proposed Bye-law, which runs as follows:—

"Chap. xxiii. *Prohibition in respect of Funds.*

"The Society shall not and may not make any dividend, gift, division or bonus in money unto or between any of its members."

This Bye-law was needed to comply with the Act of Parliament regulating the Registration of Scientific Societies so that they may be free from local rates.

On the motion of Mr. Bethune-Baker, seconded by Mr. Stanley Edwards, it was passed without discussion.

REVIEWS AND NOTICES OF BOOKS.

British Insects and How to Know Them, by Harold Bastin. Published by Methuen and Co., Ltd., London. Price 1s. 6d. net; 129 pp., with 12 plates.—The aim of this little book is to provide a popular introduction to the study of British insects. It has been penned more from the standpoint of the naturalist whose interest lies with the structure and habits of living things, than of the systematist.

We are pleased to welcome this little book because, within its limits, it is well written and the information imparted is correct and placed before the reader in an easy yet scientific manner. Its chief merit is that it excludes cheaply produced and incorrectly coloured plates. It confines itself to photography, and this of a high order. It is a book that can (and ought to) be placed in the hands of all higher-form boys with leanings to natural science, with confidence. It treats of earwigs, cockroaches, and their allies. Also of book-lice, may-flies and dragonflies, bugs, aphides, scale insects, beetles, and so on up to the ants, bees, and wasps. We hope it will secure a very wide circulation, and certainly be found on the shelves of the libraries of all natural history societies.—H.E.P.

Further Notes on the Earwig.

By T. A. CHAPMAN, M.D.

My notes on the Earwig in the *Entomologist's Record* of last January left several points in some doubt, and suggested others for investigation. I bred some earwigs last spring and report some of my observations, although the results were not so complete as I wished to make them. One rather curious difficulty I met with was, that though the young earwigs and their parents usually live very amicably together, two or three broods, that I wished to watch carefully, did not do so, and made it difficult to follow their progress. It did not appear that giving or withholding animal food could be assigned in these cases as causing them to damage each other.

In 1916, the nests I observed were each made by a female earwig, but in most, but not all, of those in 1917 each nest was inhabited by a pair, ♂ and ♀, of earwigs, I also found such a nest at large, and Mr. Main sent me two pairs of earwigs taken from such nests.

How this accords with the pairings seen in late autumn I don't know, but doubt very much whether they were the same pairs. I never observed a male licking over the eggs, but as he is present all the time, and certainly assists later in the care of the young earwigs, it seems very probable that he assists in this process also.

The dates of latest survivors given below show that males survive as long as females.

As to the young earwigs eating the remains of the mother, this did not often occur, the young earwigs certainly do not occasion her death, nor do they eat her remains when other food that pleases them is abundant. It occurred in two cases that two females together occupied one nest with the young brood. The insects were very clever in hiding the entrances to their nests. I had six or seven earwigs in a jar with a view of removing the surplus as soon as a nest was made, but in several cases a second nest was made that I knew nothing of, till the young earwigs appeared, and this sometimes caused a doubt to be thrown on some of my records, so that I could not depend on them.

In one case a ♂ and ♀ that had made no nest, and appeared to be doing nothing, were observed *in cop.* on April 16th, and again on May 5th. On the 16th May there was no sign of burrow or nest, but a burrow was found on May 21st. On the 28th the ♂ was dead and the burrow ended in a nest containing eggs. The female died on July 2nd.

I expressed some considerable doubt as to whether I had correctly observed the moulting. I believe that the doubts were well founded, and that there are only five, and not seven, instars, and that at each moult the number of antennal joints is increased. The correlation of antennal joints with instars being, 1st instar 8 joints; 2nd instar 10 joints; 3rd instar 11 joints; 4th instar 12 joints; 5th instar (imago) 14 joints. I verified this in counting the moulting in certain selected specimens, and also by segregating some individuals with 10 and some with 11 joints, and finding that in every instance there was an addition of joints after a moult, no specimen of 10 joints had only 10 after moulting, nor did one with 11 appear after the moult with less than 12.

SEPTEMBER 15TH, 1917.

The period to which the hibernated earwigs, the parents of the brood, survived was not identical with the experience of the previous year. The view that no adult earwigs are to be found in June was quite true of this locality and the season of 1916. In 1917, a good many survived much longer than in 1916, a result probably due to the remarkably prolonged winter of 1916-1917, so that here, as in many other cases we are familiar with, dates of appearance and disappearance vary with the particular seasons and are not by any means dependent merely on the almanac.

In my jars, for example, a male survived till July 5th, a female till the same date, a male died June 7th, a female on June 2nd, a male on June 11th, a female on July 2nd, another on June 2nd, one on June 5th and a male on same date; others died earlier. As regards the date on which earwigs of the season first mature, an earwig had made a nest and laid eggs by December 12th, 1916. The first of the young brood to become mature did so on May 19th. These were reared in a warm room, and if we recollect that so early a start out of doors must be very rare, and if made, almost certainly with disastrous result, the date of July for the first imagines of the year to appear seems still to stand good. Two or three specimens were met with at large at the end of May and in June. These were no doubt survivors of the previous year's brood.

The eggs grow very materially during the period of incubation. This must be secured by the imbibition of fluid through the shell. The mother may often be seen moving her eggs, generally as a result of the disturbance due to opening the nest, but she may, when a view can be obtained without alarming her, be seen to be apparently licking them over, whether she supplies them in this way merely with watery fluid or whether it contains also some nutrient material, I cannot say, this process may be most readily observed in one of Mr. Main's observation cages.

The following are actual measurements—

Eggs laid April 14th measured 1.07mm. long and 0.8mm. wide.
On the 24th 1·15mm. long, 0·78mm. wide;
On May 1st 1·35mm. long, 1·04mm. wide;
And on 5th 1·38mm. long, 1·07mm. wide.
Hatched 11th.

Another batch laid—
On March 28th measured 1·16mm. long, 0·8mm. wide;
On April 14th 1·27mm. long, 0·93mm. wide;
On 23rd 1·47mm. long, 1·05mm. wide;
On 29th, ready to hatch, 1·56mm. long, 1·3mm. wide.

Another series shows eggs laid 26th or 27th April—
On 29th measured 1·0mm. × 0.75 mm., and 0.95mm. × 0.77 mm.;
On May 5th 1·08mm. × 0·81mm. was the measurement of each of two eggs;
On May 11th 1·38mm. × 1·07mm., *i.e.*, five days before hatching, which occurred on the 16th, the measurement happened to be the same as at six days before hatching in the first batch. The increase here would be almost exactly three-fold.

The first of these batches, like the last, was just missed for a last measurement before hatching, and so the full increase in size is not shown. The second set of measurements therefore gives a better result. As the egg is practically circular in cross section, we can easily calculate the actual bulk, on doing so it appears that the egg just before hatching is more than three and a half times larger in cubic contents than the newly laid egg. The first batch up to six days before hatching increased in bulk nearly two and a half times, in this case, and in the third batch, there can hardly be any question of any of the increase consisting of air in the tracheae as may be the case, when hatching is imminent. The eggs in the nest are not in sufficiently moist surroundings to account for the supply of imbibed fluid apart from the ministrations of the parent earwig. The situation is different from that of various sawflies and some Lepidoptera, whose eggs are within the living tissues of a plant.

The eggs in a batch usually present several very definitely smaller than the others, with one or two intermediates. I do not know whether these smaller ones are the latest developed. The remainder are, to all appearance, of a uniform size, in the batches selected for eggs measuring the increase of size during incubation, only average were selected for measurement.

At moulting, the phenomenon, to which I called attention in a paper to the South London Society in 1902, and called inflation, is very evident. After each moult the insect is white and of a larger size than it has, when some time after, its cuticle has hardened and become brown, and it is sufficiently translucent to show that the abdomen contains a cavity, the alimentary canal, full of air. The difference in size is easily realised when the newly moulted insect is compared with its fellows that had moulted a day or two before, it is obviously larger. The following measurements illustrate this: At 12.30 p.m. on April 10th, two larvæ were observed just moulted for the first time, they measured in length 4·8mm. and 5·2mm. Two hours later (at 2.30 p.m.) they were still very white and measured 4·3mm. and 4·8mm. long respectively. At 7.30 a.m. the next morning each was 4mm. long, but had not yet become fully darkened. At 1 p.m., after feeding, they were 4·8mm. and 5·0mm. long respectively.

On June 2nd there was a newly moulted male, still quite white, amongst others that had also moulted to the imago state, but had matured in colouring. The note made at the time, is that, the abdomen from end of wings as closed up to bases of cerci is obviously longer than from head (anterior margin of prothorax) to end of wings, whilst in those about that are brown, this portion of the abdomen is much shorter than the thoracic piece, it is also thinner and flatter than in the white one, beside which they look pinched and starved. The white one is obviously "inflated." Except the last two segments the abdomen is very translucent and filled with something quite transparent, probably air, which it proves to be when the abdomen is pierced by a needle, when a trace of fluid exudes under pressure, enough to make the air pressed out bubble. The abdomen is then shrunk to the dimensions of those of the other mature imagines. This starved and pinched look is due to their not being yet fed since their change. An earwig, as ordinarily seen, has considerable abdominal contents—food, fat, etc.

I separated some recently hatched larvæ from the rest of the brood, with a view to determining how they would get on without the maternal care. They got on fairly well till half-grown, and then several escaped, showing perhaps my negligent care of them, in consequence, probably, of which only one finally matured. They did not progress nearly as rapidly as their brethren under maternal care. I considered this to be largely due to the food supplied them, not being in a properly damp nest, was not always so satisfactory as was desirable, and also to the fact that they had to find it, not always so easy as it looked when the larvæ were small. I concluded that the young earwigs could very well find their own living if at large and without maternal care, but would be handicapped as to always finding food when they wanted it, but that probably want of all defence against enemies would be their most serious deficiency if left to themselves.

It was observed in a particular case in which there were two nests of about the same age in one jar, that the young earwigs, if they wandered from the nests, which they often do in the second and third instars, would, on being disturbed, make for either nest, and were apparently equally welcome though it was not their own. I have, for instance, turned one nest out, and a goodly number would soon find the other where their entry was in no way resented or specially noticed.

The six curious circles found in both the living earwigs and in the cast skin, and whose nature puzzled me, appear to be the chitinous margins of glandular masses in the intestinal wall, some little way above the anus, and are cast with the intestinal lining at each moult. In mounting in balsam the rest of the intestinal lining becomes invisible, by other procedure this difficulty was obviated, and an examination of such specimens showed the lining membrane.

With hardly any preparation the glands in the intestine were seen to be bounded on the intestinal wall by the rings, and to have a thickness rather less than their width, and each is richly permeated by tracheæ and tracheoles. The six glands are disposed in two sets of three, one in advance of the other. The anterior set has one gland mid-ventral and two lateral. The posterior set alternate with these, one mid-dorsal and two lateral, but ventral to the forward lateral pair.

My experiments on regeneration of antennæ, etc., were so far vitiated by confusion with injuries inflicted by the earwigs themselves that I am not satisfied that any of my results are trustworthy. I fancy that the experiments encouraged mutual injuries, but these were most abundant, affecting almost every example in the brood, in the case of one set of larvæ, where I was quite unable to suggest any cause, except perchance more than usual original sin in that particular sample.

New Subspecies of Caligo.

By J. J. JOICEY, F.E.S. and W. J. KAYE, F.E.S.

Caligo teucer subsp. *joasa*, J. & K.

Forewing as in typical *teucer*, except that the slaty-greenish area between veins 1 and 2 in the basal area is paler and the transverse yellow band more pronounced. Hindwing with the whole of the basal half of the wing brilliant shot peacock blue. Marginal half deep black with very pronounced white fringe from vein 7 to vein 2.

Habitat.—Upper Amazon, San Joas, Solimces.

Type in coll. Joicey.

Caligo teucer subsp. *semicaerulea*, J. & K.

Forewing as in typical *teucer*, except that the yellow transverse band is more pronounced and the broad black marginal half more opaque. Hindwing alone with the bluish green area not extending much further than half way across the cell. The blue across the post median area of the cell quickly changing to greenish, thence to base. Marginal half opaque black.

Habitat.—Central Peru, La Merced.

Type in coll. Joicey.

Caligo teucer subsp. *cachi*, J. & K.

Differs from *menes* from Chiriqui in the forewing pale area being considerably paler, and the blue reflection of the hindwing being less intense. In size generally smaller, some males being even smaller than male *memnon*.

Habitat.—Costa Rica, Cachi, 3,000 ft.

Type in coll. Joicey.

Note.—The *Caligo telamonius* figured in the *Biologia Cent. Am.*, by Godman and Salvin, as coming from Calobri, Panama, is equal to *menes*, Stich., but is rather an undersized specimen for that region.

Caligo teucer subsp. *ecuadora*, J. & K.

Like *C. teucer* subsp. *semicaerulea* from South-East Peru, but paler in the forewing and with the blue basal colouring less intense, and more overlaid basally with greyish green.

Forewing in basal area, below the median vein, pale slaty-grey. Outer marginal area pale, well defined, and lighter than in *semicaerulea*.

Habitat.—Ecuador. No more precise locality, but it is most likely Eastern and not Western.

Type in coll. Kaye.

Caligo eurilochus subsp. *delectans*, J. & K.

Forewing very transparent light greyish with the post-median pale light creamy-yellow band merged in the ground colour towards the base. The mottling on the underside showing through over the greater part of the wing area, even in the broad black marginal band. Hindwing with a broad black marginal band, slightly shot with bluish purple, the base greenish merging into deep violet blue. Underside of forewing below brownish-grey, very finely mottled with slender white striæ, including the outer half of the inner margin. Inner margin near base with a greenish area. In the inner half of cell is a mottled pattern with two brownish areas. Two subapical black spots with small white crescent-shaped marks behind. A well defined eye mark between veins 5 and 6, and a black spot between veins 2 and 3. Underside of hindwing below brownish-grey, not blackish-grey, otherwise very like *C. eurilochus* subsp. *minor*. Eye spots near costa and below cell not markedly enclosed within a dark area. No white transverse streak in cell from vein 7. Two ♂s.

Habitat.—Venezuela, Patao Guiria (August, 1891).

Type in coll. Rothschild. Co-type in coll. Joicey.

This curious race of *eurilochus*, if it is really a form of *eurilochus* and not a distinct species, is remarkable in being so different from the

Trinidad race, subsp. *minor*. In shape it is also longer-winged, besides being more transparent.

The harpe is like that of *eurilochus* subsp. *braziliensis* and *eurilochus* subsp. *morpheus*, and although identical genitalia are not absolute proof of co-specificness, yet in this case, coupled with other characteristics, we do not think we here have any other than a remarkable local race.

SCIENTIFIC NOTES AND OBSERVATIONS.

ABNORMAL UNION IN HYPONOMEUTA EUONYMELLA (CAGNAGELLUS).—While passing by a fence at Sydenham the other day I saw three specimens of the above species sitting together, forming a figure Y. On looking closer I found that two males of *H. euonymella* were united to one female. The trio were carefully boxed and kept. After forty-eight hours they were still joined, but examination showed that both males were dead. The three were then put into the cyanide bottle, and since then, still united, they have been handed over for microscopical examination.—H.J.T. *August* 10*th*.

TWO MALES PAIRED WITH ONE FEMALE!—A short time ago Mr. H. J. Turner brought me three specimens of *Hyponomeuta euonymella* (*cagnagellus*), which he described in terms much like those heading this paragraph. They were dead and dry and certainly had an appearance to fully justify such a description. No very clear view of them could be obtained on account of the wings of two of the specimens surrounding the critical position.

I damped the specimens carefully, just enough to enable me to remove the wing drapery without danger to the specimens, and found I had been very successful, as no disturbance of the embraces of the specimens occurred. The actual state of matters was then easily seen, one male was paired with the female, the other male was firmly attached to the fifth or sixth abdominal segment of the first male apparently having a firm grip by the claspers.

Mr. Turner's *prima facie* view of the specimen is one that has, I believe, been given as the description of occurrences of a similar sort, though I cannot at the moment recall any actual record.* It is obvious that had the second male gripped the first, not by an abdominal segment, but say by one of its claspers, or thereby, it would have been very difficult to demonstrate the true state of matters, the attempt would probably have separated the insects, leaving the facts in some doubt. We may, I think, feel tolerably certain, that two males truly paired at the same time with one female is practically an impossibility.—T. A. CHAPMAN, Betula, Reigate. *September*, 1917.

NOTES ON COLLECTING, Etc.

AGRIADES CORIDON AT ROYSTON.—Reports say that *Agriades coridon* is again most abundant at the now well-known Herefordshire locality.

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* In the *Proceedings of the South London Entomological and Natural History Society* for 1908-9, p. 96, two males of *Zygaena filipendulae* "in cop. with one female" were exhibited by Mr. Buckstone.—H.J.T.

But so far I have heard of nothing very remarkable in the way of aberration.—H.J.T. *August 10th.*

ABUNDANCE OF AGRIADES CORIDON.—I have never seen such huge quantities of *Agriades coridon*, and as for varieties, I have not seen the like. The species was full out in mid-July, and no doubt could have been taken at the end of June. Now (August 27th) they are worn to shreds and practically all over. Ab. *semisyngrapha* was so common that on one occasion I had three in my net at once.—C. P. PICKETT.

THE ABUNDANCE OF "WHITES."—Many reports have come to hand of the abundance of our three common Pierids, *Pieris brassicae*, *P. rapae* and *P. napi*, in many parts of the south-east of the country, but further west the numbers do not appear to be above what is normal for this time of year.* Even in the city streets one sees them. A few days ago a specimen of *P. brassicae* was careering about Holborn in strong flight, and finally essayed to enter a shop, choosing, strange to say, that of Messrs. Carter, the well-known nurserymen. In some parts they have been very prone to drink, settling on patches of moisture a dozen or twenty together, following the water-cart, congregating on bare patches in the chalk downs, etc.—H.J.T. *August 12th.*

GORTYNA OCHRACEA FEEDING IN POTATO-STEMS.—The larvæ of this species, which generally lives in the stems of the thistle, have this year been met with feeding in potato-stems. The late C. G. Barrett (*Lep. Brit. Isles*) says that it had been reported as attacking potatoes. Query. When and where are the ova laid?—H.J.T. *August 18th.*

A PREVIOUSLY UNNOTED (?) ABERRATION OF ARGYNNIS CYDIPPE (ADIPPE).—A short time ago, while browsing in my duplicate boxes to see if aught noteworthy could be found there, I came across a form of aberration which I had not seen before and of which I could find no mention in the various authorities I consulted. The aberration consisted of the presence of silvery points in several of the large round black spots which lie across the post-discal area of the underside of the forewings. The character was present on both forewings. The specimen came from Pré St. Didier, on the southern side of the Alps, a place noted for brilliantly coloured races of several species besides that of *A. cydippe*. When the specimen was shown at the South London Entomological Society's Meeting on July 26th, no one there had seen this aberration, but at the subsequent meeting on August 9th, Mr. B. Adkin exhibited a British specimen, taken this year in Kent, which showed similar aberration.—H.J.T. *August 12th.*

THE GREAT ABUNDANCE OF AGRIADES CORIDON NEAR STROUD.—Visiting a habitat of this species on a hill overlooking this town on the afternoon of August 4th, I met with the insect in the utmost profusion, the males literally swarming nearly everywhere on the high ground, but the most striking sight was the congregating of this sex in closely packed bunches in places, not invariably the dampest, on the bill paths, on the escarpment of the bank, occasionally in an overhanging situation, and on the cattle droppings. These assemblies, in one or two instances, must have numbered quite a hundred, probably more, while smaller parties of forty or fifty were of frequent occurrence. As the weather was cloudy and what is termed "close," much rain having fallen overnight and some in the early morning, it would be extremely favourable for the retention of any odour, and these gatherings might be explained by a female having emerged at or visited these spots before fertilisation, or could it be anticipatory of the former event? The large preponderance of the males would lead to very early pairing of the female, and it was noticeable at this time of the day, the females, not *in cop.*, remained unmolested. The presence of the pupæ on the soil of the paths, or anywhere else, would not be unlikely, as when (June 15th) I was on the ground, the great plenty of the insect was in a way foreshadowed by seeing the larvæ crawling freely about the road—a spectacle which, though I have been familiar with *A. coridon* here for more than a quarter of a century, I had never seen before. No variation of any consequence was noticed among these hosts. The butterfly was first observed out on July 13th.—W. B. Davis, 3, Rosebank Villas, Churchfield Road, Stroud, Glos. *August 14th*, 1917.

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* *P. brassicae* and *P. rapae* were in abnormal numbers at Guildford in late July, and still more so at Camberley.—G.W.

[This note recalls to my mind an almost exactly similar scene on the floor of a quarry on the margin of the Lake of Lucerne, between Vitznau and Gersau. During my holiday in the Alps in 1914 similar assemblages, mainly of blues, were a daily sight, especially on the rough road leading up to the Suvretta Thal, St. Moritz. It seemed to me that it was not merely water that was sought by these "drinkers," but water flavoured with animal droppings or urine. On one occasion, some years ago, when going from Gex towards the Faucille Pass, in the Jura Mountains, I met with a large assemblage of "blues," mainly *Polyommatus icarus*, *Plebeius argyrognomon*, and *Aricia medon*, thus drinking around a clump of grass which had been frequented by dogs. —H.J.T.]

The capture of Papilio bianor near Lewes.—A specimen of *Papilio bianor* was captured near Lewes on June 11th last, and is now in my collection. The insect was secured by means of a fish-landing net, being the only thing available at the time, and was taken about 7 p.m. It had settled on the leaf of a chestnut tree, and I thought it was a bat when first seen. It measures just over four inches in expanse of wings, and except for damage to one of the "tails" by the net, is in good condition. Two other specimens of presumably the same species were seen in the same district in the course of about a week. As the species inhabits China, Korea, and Japan, it would be interesting to know the reason of its occurrence; but it is, without much doubt, "an escape."—Edward J. Bedford, Lewes. *July*, 1917. [I have just heard that some specimens of *P. bianor* have been on exhibition at the Zoo, Regent's Park, and that one or two have escaped. This probably accounts for the occurrence of the specimen, an account of which I sent you yesterday.—E.J.B.]

Aplecta occulta at Mucking.—A neighbour has brought to me for identification two specimens of this *Noctua*—taken at rest in the garden in June of this year. The specimens are curiously enough quite as dark as my series from Rannoch. I have never found this species in this neighbourhood before.—C. R. N. Burrows.

Abundance of Butterflies.—I have been down in Devonshire again and have seen more butterflies than I ever remember in England. —G. T. Bethune-Baker.

Colias Edusa.—I saw *Colias edusa* quite fresh while in Devonshire.—G. T. Bethune-Baker.

I am now taking *Colias edusa*, and have found a new locality for the dark race of *Gnophos obscurata*. The former seems widely distributed in Sussex and Hants.—C. W. Colthrup, Bournemouth. *August* 22*nd*.

Field Notes from Bath and the Neighbourhood.—Since the publication of my former contribution on this subject, I have received a very interesting letter. The writer points out that I am quite wrong in my supposition that Bath had escaped the attention of the entomologist. I now beg to withdraw the remark, as I see by the letter that this is certainly not the case. The writer mentions the names of some local entomologists and also kindly gives me the titles of some publications where details may be found.

To continue my notes, June 29th was wet and I only took a stroll in the Victoria Park. Here a larva of *Gonoptera libatrix* was seen on willow and the larvæ of *Phyllocnistis suffusella* were mining the leaves of poplar in abundance. The next day we walked to Combe Hay, and the only specimen seen this summer of *Elachista albifrontella* was taken. On 1st July *Dictyopterx loeflingiana* put in an appearance, as did also *Pyrameis atalanta*, a very tattered specimen. Two days later, Bathford was again the scene of operations. There is a fair amount of thyme growing here, especially towards the upper part of the down. Three species connected with this pleasant herb occurred, one fine *Coleophora lixella*, two *Scythris senescens* and *Merrifieldia tetradactyla* in profusion. On rest-harrow *Marasmarcha lunaedactyla* was also abundant. By chance I noticed a Depressariid trying to hide under a thistle leaf. It proved to be *Apnopteryx nanatella* (belonging to the section with veins 2 and 3 of the forewings stalked). I have seen larvæ here which I assume to be those of *A. applana* and have found the larvæ of *Depressaria* (section with veins 2 and 3 separate) *heracleana*, but so far have not come across any other species of either genus, sugaring being out of the question. On the way back, near the village, several moths were found at rest on a fence of corrugated iron, among them being a fine *Tortrix fosterana*. My walks seldom lead along the banks of the Avon, brt on one occasion *Hydrocampa stagnata* was noted. At Midford, on July 6th, a black Tortricid was boxed. When off the board its structure was examined, and this proved it to be only a male *Steganoptycha naevana*. The ordinary form of this species was abundant round hollies in Victoria Park. On the same day other black Tortricids were common on a hawthorn hedge at Midford, these were *Cnephasia nubilana*. While on this subject, I may add that I also took here another very dark species, *Laspeyresia nigricana*. The next afternoon was spent at Conkwell, where the first *Nudaria mundana* showed itself. This species was afterwards often seen in both counties. Among other species netted were the following: *Aegeria ichneumoniformis*, *Anisotaenia ulmana*, *Cacoecia xylosteana* and *Gypsonoma dealbana*, and one large Phycid, not yet identified. On a small whitethorn bush were nests of a sawfly larva, which I never remember to have seen before. The larvæ were ochreous brown, some about 6mm. long, while others were about three times that size. They lived in webs spun thickly over the branches, like *Hyponomeuta padellus*, but there was much more silk used than in the webs of the "ermine." On the 8th *Cerostoma scabrella* emerged, the larva having been taken previously in Queen Square. I have seen three other specimens of this in Bath. In a lane at Combe Down, on the 10th, *Cacoecia rosana* was excessively abundant. *Bryotropha acuminatella* occurred and *Scopula prunalis* was no rarity. About this time *Tinea semifulvella* and two specimens of *Sphaleroptera ictericana* were found on a hawthorn hedge near the town. On the 12th, again at Bathford, I watched *Sesia* (*Macroglossa*) *stellatarum* hovering at flowers close to the ground and saw one or two *Plusia gamma*, two *Harpipteryx xylostella* in a bush, and took one *Anacampsis taeniolella*. *Ancylis comptana* are freshly out in its second flight, and there were many *Zygaena filipendulae* on thistles and knapweed. Two specimens, with each pair of spots confluent, were noticed, and one or two with pink spots on the forewings and red hindwings. These latter had probably been well washed by the rain on the forewings, while the hindwings were tucked away safely beneath. At Combe Down *Cacoecia podana*, *A. ulmana*, *Tortrix heparana* and *T. ribeana* came out of the hedges, as well as *Ebulea sambucalis* and *Hypena proboscidalis*, while *Swammerdammia lutarea* was enjoying its afternoon flight over the hedges. Mines of *Lithocolletis spinicolella* (one bred) and *Nepticula plagicolella* were frequent on blackthorn. The afternoon of the 14th was hot and sunny on the Bathford Down, and it was a day when the *Pyraustidae* enjoy themselves and the entomologists also. *Pyrausta purpuralis*, *Ennychia cingulata* and *E. nigrata* were all flying together over the short herbage and constantly settling on the various flowers. After this day the weather became unsettled and somewhat rough. On the 19th, in a lane near the town, the appearance of two species showed the progress of the year. *Croesia holmiana*, and especially *Peronea variegana* were evidence that June was over. The specimen of the latter species was of the form *cirrana*, and I have since seen the white and grey, the ochreous and grey, and the form with the dark blotch on the costa. In this lane there are a few bushes of *Euonymus* and *Hyponomeuta plumbellus* occurs in the hedge, as it does in several other parts of this district. On the London Road, beyond Bathford, a few *Hemimene petiverella* were found on the "weeds," among which were one or two plants of *Hypericum*, and from these a specimen of *Gracilaria auroguttella* was taken. This surprised me, as when I have previously taken this species, as at Box Hill and Clandon, it was among great masses of the food plant. I saw one *Melanthia procellata*. Clematis is everywhere abundant in the hedges here. On the 21st the wind prevented things from flying, but the following were seen at Conkwell, *Oecophora fuscescens*, *Gracilaria auroguttella*, *Crambus inquinatellus*, *Poecilochroma corticana* and *Epinephele tithonus* in rich condition. On the 24th, at Combe Down, *Eupoecilia dubitana* was taken and a beautifully white *Crambus perlellus* boxed. The next day, in a walk near the town, I noticed several *Bryophila perla*, and came across a bush of *Phillyrea media* in a garden. This is a south European plant belonging to the olive family, like ash and privet. I mention it because *Gracilaria syringella* had also found it and was mining in the leaves. On the 26th, at Bathampton, on a railway bank, *Ancylis lundana* was on the wing in abundance and two *Strenia clathrata* were flushed. The following day, at the foot of the Bathford Down, under the shelter of bushes, I discovered some Nepticulid mines in the lower leaves of *Agrimonia eupatorium*. All but one larva had left the mines. These began as very fine galleries and ended in a large blotch. There is little doubt that they were the work of the larvæ of *Nepticula aeneofasciella*. Two larvæ of *Theretra porcellus* were found on *Galium saxatile*, one small and green, the other fully grown and brown. From fir trees some *Semasia nanana* were shaken, and several *Scopula lutealis* were disturbed from the undergrowth. On the down *Anacampsis taeniolella* was quite common. Not that one saw them on the wing, but often in the sweeping net. I was very pleased to take one specimen of the ab. *sircomella*, without the white fascia on the forewings, and one *A. vorticella* also fell to my lot. On the 28th July, one *Monopis rusticella* was seen at rest on a hornbeam in the Victoria Park. On the 31st, one *Nepticula anomalella* emerged from the mines collected at Bathford. Thus July, one of the best months for collecting, did not provide much excitement. All the same, it is always a pleasure to see Lepidoptera in the field, on the wing, or at rest, even if the species are generally common and of no particular account.—Alfred Sich. *August 29th*, 1917.

Butterflies drinking and Essex records of butterflies.—If you think this fact worth recording, I should just like to mention that to-day I saw from twenty-five to thirty white butterflies, mostly *Pieris rapae*, sitting upon a small heap of horse manure in the middle of a road running alongside of a wood near here, and a little further on another small batch upon another heap. It seemed to me rather an uncommon sight. I was out looking for *Argynnis cydippe* (*adippe*), but only saw one flying. *Pieris brassicae. P. rapae*, *P. napi*, *Epinephele jurtina* (*janira*), *E. tithonus*, *Aphantopus hyperantus*, *Adopaea flava* (*thaumas*), and *Augiades sylvanus* were flying freely. A specimen of the second brood of *Celastrina argiolus* was flying in the garden a few days ago.—E. Millar (Miss), The Croft, Rainsford Lane, Chelmsford, Essex. *July 17th*, 1917.

Abundance of Butterflies at Swanage.—I am just back from Swanage. Ten days ago, while the weather was still fine, butterflies were swarming. I counted twenty-three species, and in an overgrown field on the downs, butterflies were as common as in the Swiss alpine valleys. Here is the list observed. *Colias edusa* 3, *Pieris brassicae* and *P. rapae*, both in swarms, *P. napi*, *Agriades coridon*, *A. thetis* (*bellargus*) just appearing, *Polyommatus icarus*, *Aricia medon* (*astrarche*), *Rumicia phlaeas*, *Vanessa atalanta* common, *V. io* common, *Aglais urticae* very abundant, *Pyrameis cardui* very plentiful in one field and in fair condition, *Argynnis aglaia* common but worn, *Melanargia galathea* common but worn, *Epinephele jurtina*, *E. tithonus*, *Coenonympha pamphilus* very few, *Pararge megera* abundant, *Hipparchia semele* abundant, *Thymelicus acteon* everywhere, *Nisoniades tages* second brood a fair number, and *Adopaea flava* (*thaumas*) a few. These were all noted on Saturday August 17th.—W. J. Kaye, "Caracas," Ditton Hill, Surbiton. *August 28th*.

CURRENT NOTES AND SHORT NOTICES.

In the *Ent. Mo. Mag.* for June, Mr. H. Britten describes a new species of Coleoptera as *Ptilium asperum*, taken in an old squirrel's nest in Cumberland, in 1913. Specimens have also occurred in the New

Forest and in Scotland. It closely resembles *P. spencei* but is larger, and in shape is like *P. caledonicum*, but is darker in colour.

In the *Bull. Soc. Ent. Fr.* for May, Conte Emilio Turati describes a new race of the species we know as *Anthocharis crameri*, Btlr. (*belia*, Cr.), [see Report of Brit. Nat. Com. on Ent. Nomen., *Trans. Ent. Soc.*, 1915] but which the author calls *Euchloë ausonia*, Hb. (*belia*, Cr.). The specimens were one of the results of the opportunities offered through the conquest of Libya. Conte Turati remarks that he considers from the various material which has passed through his hands that the Lepidopterous fauna of the country is related to two distinct faunas, *viz.*, the Tunisian and Algerian on the one hand and the Syrian on the other. The race, of which examples were obtained in February and are therefore of the spring generation, he names *libyea*, and remarks that it is perhaps the smallest form known. It has a closer resemblance to the forms *triangula* of Verity from Syria, and *aegyptica* of Verity from Egypt, than to the Algerian form *algirica* (gen. ver.) of Oberthür.

In no. 10 of the same *Bulletin*, M. L. Demaison contributes his "Observations on the Lepidoptera of some of the Islands of Western Europe." He has visited Staffa and reports *Tortrix longana* as common (*Sciaphila ictericana* of our collections). On the Ile de Noirmoutier the southern type of *Pararge aegeria* with yellow markings occurs, while those on Belle-Ile seem to form a transition between that form and the northern form *egerides* of Staudinger. In Belle-Ile *Argynnis pandora* occurs and it is quite common on the western coast of Noirmoutier.* *Ortholitha peribolata*, a species which was sent to us many years ago by Mr. A. J. Hodges, the first proprietor of this magazine, from Guernsey, was met with commonly on the Isle de Chausey, where also *Zygaena trifolii* was taken by the author. This last form was a confluent one and much resembled, at first sight, *Z. lonicerae*, but according to M. Oberthür the species found on the island is *Z. trifolii*.

The Rev. F. W. Johnson announces in the *Irish Nat.* the capture of a pair of an Ichneumon species new to Britain, *viz.*, *Lissonota basalis*. It was taken in August, 1915, and considered then as *L. sulphurifera* to which the new species is allied. On the Continent it occurs in N. Germany and Sweden, and has been bred from the larvæ of *Tapinostola elymi* and *Hadena sufturuncula* = *Miana literosa* (Staud. List.) It was taken at Poyntzpass, Co. Armagh.

Our earnest sympathies go out to Mr. Champion, the hon. librarian of the Entomological Society of London, in the loss of his youngest son, who was recently killed at the front.

The Local Government Board has issued the following memorandum to the various Entomological Societies of the country:—

MEMORANDUM AS TO INFORMATION DESIRED REGARDING THE PREVALENCE OF ANOPHELINES.

In connection with possible risks of malaria being acquired in this country, the Local Government Board are anxious to collect as much information as possible at the present time regarding the prevalence and distribution of Anopheline mosquitos in various parts of the country. Naturalists and field entomologists could give much valuable help in the matter:—

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* It is far from uncommon on the mainland near Belle Isle, where it appears about the 2nd week in June.—G.W.

(*a*) By keeping notes and records, *beginning at once*, of any adult insects which they may meet with during natural history researches, etc., and also of the detection of Anopheline larvæ.

(*b*) By forwarding any information on the subject already in their possession.

RECORDS.

In making records the following are important:—

ADULTS.—Date.
Hour of collection.
Place (if in a building specify its nature).
Condition of weather and temperature.
Whether few or abundant.

LARVÆ.—Date.
Hour of collection.
Locality.
Nature of collection of water (natural or artificial).
Nature of breeding place (shady pools: open collections of water: presence or absence of weed, fish, etc.).

IDENTIFICATION.

As regards differentiation of Anophelines from other species reference may be made to the British Museum pamphlet on Mosquitos (Economic Series, No. 4. British Museum. Price 1d.), or, of course, to any other text books. In case of doubt as to the identity of insects collected, specimens may be sent for identification by post addressed (O.H.M.S.) to The Medical Officer, Local Government Board, Whitehall, London, S.W. 1, and marked on the cover "Entomologist."

Letters relating to investigations (*a*) and (*b*) above should be similarly addressed.—Medical Department, Local Government Board, 27*th August*, 1917.

A long series of separata have reached us from the Smithsonian Institution, Washington, during the past few months, among them are—

1. "Notes on the Life History and Ecology of the Dragonflies (Odonata) of Central California and Nevada," is a further contribution to the Odonata fauna of the Pacific Coast of N. America. It contains a large amount of biological rather than descriptive matter, and is illustrated by more than 400 figures in the text. Much of the matter consists of observations on the earlier stages, critical remarks on the genitalia, habits of oviposition, which differ in the different Odonate families, protective coverings in the nymphal stage, etc., and lists of the associations of dragonflies observed at nearly forty localities. In a subsequent paper the author, C. H. Kennedy, proposes to discuss the Odonate fauna of Southern California.

2. "A new American Parasite of the Hessian fly, *Mayetiola destructor*." Some years ago this fly was found to have migrated to this country, and considerable attention was called to it in fear of the consequences to our wheat crops. Apparently conditions were by no means favourable to any abnormal increase of the pest and nothing further has been heard of it here. But in the United States the Hessian Fly is a foe to be considered. In this memoir P. R. Myers

describes a new Proctotrypidid as *Polygnotus vernalis*, and states that it has been bred from the Hessian Fly puparia collected in a large number of localities.

3. "An Asymmetrical Bird-louse found on three different species of Troupials," by J. H. Paine. The type of asymmetry in the species, *Philopteneus ambiguus*, consists "of a rather deep clypeal emargination, appearing symmetrical in the very young stages, but becoming pushed more and more to one side in the succeeding instars until, in the adult, the emargination may overlap tha chitinous thickening of the side of the head." There is a good plate in illustration.

4. "Report on a Collection of Hymenoptera, mostly from California."

5. "Descriptions of thirty-one new species of Hymenoptera, mostly reared as parasites on forest insects," by S. A. Rohwer.

6. "The Type-species of the Genera of the Cynipoidea, or Gall-wasps and parasitic Cynipoids," by S. A. Rohwer and Margaret M. Fagan; a useful compilation for the fixation of types.

7. "Some Fossil Insects from Florissant, Colorado," by T. D. A. Cockerell. This consists of description of new species from this wonderful mine of fossil insect forms. Three are sawflies, bringing the total species of fossil sawflies found at Florissant to 42. One new fly brings the *Bibionidae* to 6 species, another new fly brings the *Asilidae* to 14 species. There are also included specimens of a Neuropteron and a Hemipteron

We are pleased to hear that the son of M. Oberthür, Charles Oberthür, Captain of Artillery, has been awarded "la croix de guerre et de la légion d'honneur."

Aught of the potato seems to attract the attention of many just now. A correspondent's box was put in our hands the other day, on the lid of which was pasted the following paragraph. THE POTATO BUG.—Here (observes a Canadian contemporary) is a good thing on the Colorado 'tater-bug.' Three men comparing notes—one says, "There are two bugs to every stalk." A second says, "They have cut down my early crop and are sitting on the fence waiting for my late crop to come up." "Pshaw!" says the third, "you know nothing about it. I passed a seed store the other day, and saw the bugs looking over the books to see who had purchased seed potatoes."

From a short report received we note that there is a Natural History Society at Guildford which has more than a hundred members, but although among the main activities, rambles and country visits form a large proportion, yet there appears to be very little, if any, nature study. The country around, we know, is full of entomological possibilities, and Guildford has railway facilities in no less than five directions.

The *Canadian Entomologist* for June contains mainly descriptions of new species of *Aphidae*, Sawflies, Heteroptera and Crane-flies, with notes on two apple-leaf mites, the "silver-leaf," *Phyllocoptes schlectendali*, and the "rusty-leaf," *Eriophyes malifoliae*. There is also a short book notice on the new "Check-list of the Lepidoptera of Boreal America," Barnes & McDunnough, of which a copy has not yet reached us.

The *Irish Naturalist* for July has an interesting contribution on the "Lepidoptera of Ireland," by Sir Charles Langham. In Co. Clare

Zygaena purpuralis (*pilosella*), race *nubigena*, "was so plentiful that it would have been impossible to overlook it;" only a few specimens of *Platyptilia tessaradactyla* were obtained. Ballyvaughan, Co. Clare, was the centre of the area collected over. Among other captures were *Leptosia sinapis* a few, *Cupido minimus* a few, *Aegeria musciformis* two, *Theretra porcellus* very plentiful, *Parasemia plantaginis* common, *Setina irrorella* fairly common, *Gnophos myrtillata* (*obfuscaria*) one, *Eupithecia venosata* two of the smoky form, *Anticlea cucullata* three specimens, *Ennychia octomaculata* locally common, *Hyponomeuta padella* larvæ and cocoons in thousands in some spots along the coasts, *Hypercallia christiernella* (*citrinalis*) one, believed to be new to Ireland, etc. At Pontoon, in Co. Mayo, *Coenonympha tiphon* was very abundant, *Diacrisia sannio* (*russula*) was very common, *Cymatophora or* and *C. fluctuosa* occurred, *Eucosmia undulata* fairly abundant, *Tortrix viridana* one only on an island in Lough Conn, *Acronicta leporina* at treacle, and *Drepana falcula*, among other species. The writer reports a yellow aberration of *Euchelia jacobaeae* taken in Tempo in June, 1915, and also the occurrence of *Schoenobius mucronellus* in Sligo in July, 1915.

The *Proceedings* of the Dorset Natural History and Antiquarian Field Club have for many years past published reports of field-work, containing a vast amount of useful detail, the result of patient and continuous close observation. Of such a nature is the "Phenological Report on First Appearances of Birds, Insects, etc., and First Flowering of Plants in Dorset during 1915," by our correspondent, W. Parkinson Curtis. This report of nearly 60 pages, with 5 plates, is the summary of the returns of about a dozen active members of the Society from various parts of the county. The entomological (Lepidoptera) notes are practically all by W. P. Curtis, and the section on "Birds," with which the report is largely filled, is a descriptive account, of which the "Coloration Problem" notes in our magazine recently are the summary. This kind of work is tedious to carry on and tedious to record, but probably nothing is more useful as a basis for future generalisation. The first plate shows a tree-creeper, *Certhia familiaris*, race *britannica* ♂ at nest, with a beakful of insects.

The July number of the *Canadian Entomologist* contains two very interesting articles. 1. An account of the Collection of Macrolepidoptera owned by F. H. Wolley Dod, by the owner. The special feature of the collection is the North American *Noctuidae*, which have been collected and studied largely from a point of view of variation. All the insects are labelled in the modern way, with full data and with a reference number to a set of MS. books containing critical notes. Considerable trouble has been taken to make a card index somewhat elaborate in detail. Each species and named form has a card devoted to it, which contains its name, authority, reference to original description and date, to the more important bibliography and to catalogues, to figures, to monographs, to genera and dates, the present locale of the type, synonyms, with references to pages in MS. note books, to slides of the genitalia, to drawer or box in the collection, etc. As is stated it will be understood that the collection is essentially for study. 2. "The Death-feigning Instinct." After giving examples of this habit from all classes of animals, the writer, E. Melville Duporte, remarks that "It is among insects, however, that the death-feigning instinct is most widely distributed, especially among the Coleoptera and Hemiptera. The active flyers such as Diptera, Hymenoptera and Lepidoptera seldom feign death." This death feint in insects falls into three classes; (*a*) The insect on receiving a shock becomes rigid without releasing its hold. (*b*) The insect when disturbed rolls itself into a motionless ball. (*c*) The insect releases its hold, contracts its legs and antennæ, and falls to the ground, where it usually remains motionless and apparently dead. Reference is made to the classical example given by Kirby and Spence of *Anobium pertinax*, which may be literally pulled limb from limb without moving a joint. The writer argues that the advantages of this instinct to its possessor is doubtful, and gives the most probable theory of the nature of the death-feint as "an example of negative thigmotaxis, that shrinking from contact characteristic of so large a proportion of all classes of animals."

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

March 7th.—DEATH OF A MEMBER OF COUNCIL.—The death of Mr. A. E. Gibbs, a member of the Council, and for five years a most valued member of the Business Committee, was announced.

SOUTH INDIAN HEMIPTERA, ETC.—Mr. E. A. Butler exhibited two species of S. Indian Hemiptera *Urentius echinus*, Dist., and *Apollodotus praefectus*, Dist., received from Mr. T. V. Campbell, M.B., who captured them at Chikkaballapura in the Mysore State.

Also several recently described species of S. Indian *Fulgoridae*, together with the ♂ of *Eurybrachys tomentosa*, Fabr., which has only recently been recognised.

NOTES ON MIMICRY IN ORIENTAL BUTTERFLIES BY COL. T. JERMYN.—Prof. Poulton said that he had recently received some interesting notes on mimicry, and had tried to induce the author to communicate them in person. Col. Jermyn, being unfortunately prevented from coming, had forwarded with his manuscript the illustrative specimens exhibited to the meeting.

AMMOPHILA SABULOSA, L., WITH ONLY TWO SUBMARGINAL CELLS TO BOTH FOREWINGS.—A male *A. sabulosa* with two instead of three submarginal cells in each forewing was exhibited to the meeting by Prof. Poulton.

The President stated that, at Prof. Poulton's request, he had recently examined the specimen from the Burchell collection (No. **1330**), which was shown that evening, and he had no hesitation in saying that it was either a larva or female of the group *Phengodini*. The females of this group are completely larvi-form. Both larvae and females may be distinguished from Elaterid larvæ by the fact that the tenth abdominal segment is somewhat conical or tubular in form, and projects beyond the ninth segment so as to be visible from above.

NEW CETONIIDS FROM BRITISH INDIA.—Mr O. E. Janson exhibited the four new species of *Cetoniidae* of the genera *Clerota*, *Pseudocalcothea* and *Anatona*, described in the paper subsequently read, and made some remarks on their characters.

TEMPERATURE AT WHICH INSECT LIFE IS DESTROYED.—Mr. A. Bacot desired to call attention to a very valuable paper in the Memoirs of the Department of Agriculture in India (November, 1916, Vol. IV, No. 6

dealing with the insects attacking stored wheat in the Punjab, and the methods of combating them, by Barnes and Grove.

Gift of a Microscope.—The Secretary said that Mr. E. E. Green had offered to the Society a valuable Binocular Microscope, for which objectives of 2″ to $\frac{1}{8}$″ were required, and asked whether any Fellow had spare objectives which he would present.

Papers.—The following papers were read:—

"On new and little-known *Lagriidae* from S. America," by G. C. Champion, A.L.S., F.Z.S., F.E.S.

"Additions to the Knowledge of the *Cetoniidae* of British India," by O. E. Janson, F.E.S.

"The Condition of the Scales in leaden Males of *Agriades thetis* and other Lycænids," by E. A. Cockayne, M.A., M.D., F.E.S.

"Some Notes on Butterfly Migrations in British Guiana," by C. B. Williams, M.A., F.E.S.

Commenting on Dr. Cockayne's paper Mr. Bethune-Baker observed that the scales in these specimens were curved triangularly and were very thin instead of fairly solid. Mr. Newman said that such specimens needed to be set at once, if killed with cyanide and relaxed they began to stain in less than six hours, and that this was the case if kept in a dry cyanide bottle.

March 21st.—Election of Fellows.—Messrs. David Hunter, M.A., M.B., The Coppice, Nottingham; Nicholas J. Kusnezov, The Imperial Academy of Sciences, Petrograd, and Percy A. H. Muschamp, Charterhouse School, Godalming, Surrey, were elected Fellows of the Society.

A supposed Hybrid Butterfly.—Dr. T. A. Chapman exhibited a supposed hybrid between *Callophrys avis* and *C. rubi.*

A new British Elater.—Mr. Donisthorpe exhibited two specimens of an *Elater*, from Ireland, not in the British list, taken in Co. Kerry, in June, 1902.

Reappearance of Sunset Insects at Dawn.—Mr. Collin said that he had observed that certain Diptera usually to be seen about sunset were also on the wing about dawn, and enquired whether the same fact had been observed in other Orders.

The "Death-watch" Beetles.—The President asked whether any Fellow could state from his personal knowledge that *Anobium domesticum* taps in the manner known as the "death-watch." *Xestobium tessellatum* and *Atropos divinatoria* both tap with the mandibles, and this was shown by Derham to be a sexual call.

April 4th.—Election of Fellows.—Mr. Thos. W. Kirkpatrick, The Deanery, Ely, and Sir Charles Langham, Bart., Tempo Manor, Co. Fermanagh, were elected Fellows of the Society.

Forms of Papilio priamus.—Mr. G. Talbot exhibited on behalf of Mr. J. J. Joicey specimens of *Papilio (Troides) priamus* r. *coelestis*, Roth., from Rossel Island and St. Aignan, and the allied race *urvilleana*, Guer., from New Ireland and the Solomons.

Ova of Stegomyia fasciata.—Mr. A. Bacot exhibited masses of eggs of *Stegomyia fasciata*, the "yellow-fever mosquito."

Living "Death-watch" Beetle.—The president exhibited a live specimen of *Xestobium tessellatum*, and demonstrated its marked power of "ticking" in response to tapping on the table on which the box stood in which it was contained.

Paper.—The following paper was read, illustrated by the epidiascope:—

"Revision of the Genus *Tarucus*," by G. T. Bethune-Baker, F.L.S., F.Z.S.

May 2nd, 1917.—Election of a Fellow.—Mr Arthur Dicksee, 24, Lyford Road, Wandsworth Common, S.W. 18, was elected a Fellow of the Society.

Rare Cetoniid from Madagascar.—Mr. O. E. Janson exhibited specimens of *Euchroea coelestis*, Burm., and directed attention to the remarkably brilliant pearly blue of the underside of the body.

Genitalia of certain Species of Caligo.—Mr. W. J. Kaye exhibited two cases of *Caligo* species from the collection of Mr. J. J. Joicey as well as his own collection, together with a number of microscopical mountings of the male genital organs.

Photographs of the Ovipositors of three Siricids occurring in Britain.—The Rev. F. D. Morice exhibited a set of six photos showing the ovipositor and apex of the ♀ abdomen in three species or subspecies of the Siricid genus *Paururus*, *viz.*, *juvencus*, F., *noctilio*, F., and *cyaneus*, *F.*

Further note on the "Death-Watch" Beetle.—The President remarked that the *Xestobium* which he had exhibited at the previous meeting was still living, and that he had discovered that it was a ♀. It had tapped when touched on the head with a bit of paper, and when this was continued had extruded its ovipositor.

Papers.—The following papers were read:—

"New and Little-known Heterocera from Madagascar," by Sir George Kenrick, Bart., F.E.S.

"A preliminary Catalogue of British *Cecidomyidae*, with special reference to the Northern Gall-flies," by R. S. Bagnall, F.E.S., and J. H. Harrison, M.Sc.

June 6th.—Election of Fellows.—Dr. H. G. Breijer, Ph.D., Director of the Transvaal Museum, Pretoria, Transvaal, S. Africa, and Dr. Alfred E. Cameron, M.A., D.Sc., The Entomological Laboratory, Agassiz, British Columbia, were elected Fellows of the Society.

Two New British Coccids.—Mr. E. E. Green, exhibited two new and (at present) undescribed species of British Coccidæ, both belonging to the genus *Lecanium* and both occurring on the Birch (*Betula alba*).

Morpho adonis and M. eugenia distinct Species.—Mr. W. J. Kaye exhibited *Morpho adonis*, three males and a fine female from British Guiana, also on behalf of Mr. J. J. Joicey, *M. adonis* males and one ♀ from French Guiana, and *M. eugenia* males and one female also from French Guiana, together with preparations of the genitalia of both to show that there was no room for doubt that *M. eugenia*, Deyr., 1860, is a distinct species from *M. adonis*, Cram.

Resemblance, Mimetic and Non-mimetic.— Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited:—

1. A white-banded mimetic group of African Heterocera from the Cameroons, composed of Agaristid, Geometrid and Tineid species.

2. An example of resemblance which is not mimetic, seen in *Scoriopsis infumata*, Warr., from Peru, a Geometrid bearing a strong likeness to a species of *Lymantriidae* from Angola.

3. A mimetic group from Dutch New Guinea, composed of Danaine, Nymphaline and Amathusiid species.

4. Two forms of *Tellervo* from the Island of Misol.

5. *Papilio erlaces*, with its races, including a new race from North Peru, and showing mimetic ♀ of *P. harmodius*, Doubl., from the same district.

Birds capturing butterflies on the wing at Oxford.—Prof. Poulton reported that on the previous day (June 5) Mr. H. Britten had seen a swallow capture a Lycænid butterfly.

He also related that, as he was bicycling to the Museum that morning, a bird darted from out a garden and struck a Pierine, flying heavily after rain; the bird was frightened by the bicycle, and darted back, leaving the butterfly fluttering in the road. He got off his bicycle and, looking back, saw the bird return and carry the insect into the garden. The butterfly was *P. napi* or *P. rapae*, almost certainly the latter. The bird could not be observed very clearly, but from its size, colour, markings (so far as seen), and flight, was evidently a chaffinch.

Forms of Papilio polytes r. romulus, Cram., from Singapore Island and the mainland opposite.—Prof. Poulton exhibited the mimetic *polytes*, L., females of two series recently sent to him by Dr. R. Hanitsch of the Raffles Museum, Singapore.

Predaceous Reduviid bugs and Fossors, with their prey, from the S. Paulo district of South-East Brazil.—Prof. Poulton exhibited and described a set of predaceous insects captured 1913-16, by Dr. Gregorio Bondar in the S. Paulo district of S.E. Brazil.

Observations on Fossors in East Africa by Dr. G. D. H. Carpenter.—Prof. Poulton said that an observation recorded in a letter written to him January 18th, 1917, by Dr. Carpenter, threw further light on the storing of *Hesperiidae* by *Bembecides*.

Paper.—The following paper was read:—

"On a collection of Lepidoptera made in East Africa by Mr. W. A. Lamborn, F.E.S.," by H. Eltringham, M.A., D.Sc., F.E.S.

The South London Entomological and Natural History Society.

May 24*th*.—Yellow P. napi.—Mr. Sperring exhibited a short series of *Pieris napi* from Sligo, strongly tinged with yellow.

The British Cicada.—Mr. Edwards, specimens of the British Cicada, *Cicadetta montana*, from the New Forest.

A Durban M. atropos.—Mr. H. Moore, *Manduca atropos* from Durban.

Scarabæus beetles.—Mr. Main reported that his Scarabs were very busy trundling their balls of horse dung, and actively engaged in excavating their cells and other domestic matters.

June 14*th*.—Durban Insects.—Mr. H. Moore, a field-cricket, *Brachytrypes membranaceus* and a stag-beetle, *Lucanus* sp., from Durban.

Aberration in Euchloë cardamines.—Mr. H. J. Turner, specimens of *Euchloe cardamines* showing minor aberrations. (1) Large ♂ from Cannes, intense orange patch, edged with yellow shade, and reaching the anal angle. (2) A ♀ from Wisley with apical blotch extending nearly to anal angle, and about doubled in width by a cloud of black scales. (3) A ♀ from Box Hill with very dark apical blotch on forewings, and distinct discoidal dot on hindwings. (4) A ♀ from

Amersham with very light apical blotch which was intersected throughout by parallel bars of white. (5) A ♂ underside from Oxshott with basal half of forewing clear light yellow.

EARLY OBSERVATIONS ON P. APOLLO.—Mr. Turner also showed a copy of Jacob Christian Schäffer's work, date 1763, and called attention to the coloured plates illustrating the life-history of *Parnassius apollo*, including figures of the eversible fork on neck of larva, flimsy cocoon for pupation, structure of prolegs, and details of the curious copulatory pouch; mostly magnified.

IRISH A. PLEXIPPUS.—Mr. Frohawk, the specimen of *Anosia plexippus* captured last year in Ireland.

REPORTS ON THE SEASON.—Reports on the Season shewed that things were up to date, and generally common.

REVIEWS AND NOTICES OF BOOKS.

SEX-LINKED INHERITANCE IN DROSOPHILA, by T. H. Morgan and C. B. Bridges. Washington. Published by the Carnegie Institution of Washington, 1916.—In the autumn of 1916, at a meeting of the South London Entomological and Natural History Society, Prof. Bateson, one of the greatest of British students of Heredity, and especially of the application of Mendel's law of inheritance, gave a most interesting account of the more recent advances made in America in the study of the inheritance of linked characters. Subsequently, by the kindness of the authorities of the Carnegie Institution, Washington, a copy of a work by Professors Morgan and Bridges, *Sex-linked Inheritance in Drosophila*, a detailed report and summary of an enormous number of experiments, has been sent to us for notice in the magazine.

While it may no doubt be assumed that the Mendelian laws of inheritance will probably be proved to be of universal application, yet their satisfactory demonstration in any one organism is by no means frequently an easy matter, owing to the complicated nature of the interrelations of the various characters. In the present state of our ability, which of course rests upon our previously acquired knowledge, objects must be chosen for study which possess certain fortuitous limitations, which will mechanically facilitate not only the easy observation but also the ready manipulation. There must be a capacity for very frequent generation in the subject chosen, it must be easy and inexpensive to breed, a large number of offspring must be produced at each brood, these must possess vigorous constitutional strength, the characters to be dealt with must be "discontinuous," that is, be sharply defined (as in Mendel's peas, smooth and wrinkled, tall or short, white or purple), and each character, or rather pair of alternative characters ("allelomorph") chosen must be capable of segregation on crossing, that is there must be no contamination one with another in the hybrid.

The subjects which, up till recently, have been chosen for investigation have possessed these limitations rather less than more, such as Mendel's peas, various plants, species of Lepidoptera, pigeons, fowls, sheep, etc., in all of which objects the above limitations were only present to a degree, and it was not until about seven years ago that Professor Morgan and his talented assistants met with the small Dipterous fly *Drosophila ampelophila*, which apparently is endowed with a superabundance of the limitations necessary. "The animal breeds rapidly, going through many generations in a year. It is inexpensive to breed and the families consist of numbers, which, relatively to those attainable in most subjects, are enormous." Furthermore, "Since it first attracted Professor Morgan's attention it has been found to produce a long and intricate series of factorial varieties or 'mutations,' as the author prefers to call them, differing in the colour of eyes and body, the sizes and shapes of the wings, and other respects, the number of these differences being now computed at more than a hundred. Prof. Morgan and a band of enthusiastic colleagues set themselves with the utmost zeal to analyse the inter-relations of this mass of factors. Half a million flies have been bred, with the result that the data respecting the genetics of *Drosophila* in quantity now surpass those obtained from any other animal or plant." As Professor Bateson, whom we have quoted, says, "The advances made are on any estimate many and of quite exceptional significance. That much is certain. If we go further and accept the whole scheme of interpretation without reserve we are provided with a complete Theory of Heredity, so far as proximate phenomena are concerned."

The interrelation between allelomorphic pairs of different characters has been established by Bateson and others, *e.g.*, the association in the Chinese Primulas of the allelomorph pair, large eye and small eye, with the allelomorph pair long style and short style. Such a combination Professor Morgan has termed "linkage." Cases of such linkage have been found in several forms, but nowhere on so extensive a scale as in the *Drosophila*, where over a hundred characters have been investigated as to their linkage relations.

It is a matter of common observation that many characters, especially in animals, "are confined to one sex, or are developed differently in males and females; this is most conspicuously so in the so-called 'secondary sexual characters,' *e.g.*, the possession of pectinated antennæ in male Lepidoptera, the development of frontal processes in male Coleoptera, the hairy growth on the faces of men, etc. That such distinctively male characters are transmitted *through* the female scarcely needs assertion. Also it is a matter of common knowledge to us as entomologists, that under certain circumstances such male characters may be developed in the female. These characters are not in any way directly connected with reproduction, any more than the character of colour-blindness, which is also similiarly confined to the male sex. These associations of sex and characters have given strong ground for the suggestion that sex is a character subject to the Mendelian law. On this aspect of the subject the present work of Professor Morgan and his colleague will no doubt have a considerable amount of influence. In fact there has been discovered in this fly, *Drosophila*, an example of inheritance parallel to that seen in this last instance, colour-blindness in man. Substituting red eye and white eye in the fly for normal colour vision and colour-blindness in man, the phenomena were exactly similar. Hitherto no such case in an animal available for experiment had been known, although we were aware of several instances in which the parts played by the sexes were reversed, as in the case of *Abraxas grossulariata*, in which the very rare variety *lacticolor* is practically confined to the female sex.

In the introduction, which comprises some twenty pages, the authors first point out that the significant discovery of Mendel was not the 3 to 1 ratio, but the segregation of the characters (or rather of the germinal representatives of the characters). When the characters which form the allelomorph pair meet in the hybrid and the germ-cells are formed "*the factors segregate from each other without having been contaminated one by the other.*" It is also pointed out as a corollary of this discovery that when two or more pairs of factors meet in the germ-cells there is an *assortment* with definite F_2 ratio results, such as 9 : 3 : 3 : 1 (for two pairs), 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1 (for three pairs), etc. But although these particular ratios do not hold good when linkage takes place, Professor Morgan emphasises the fact that segregation still holds for each allelomorph. Other ratios result in the F_2 generation when certain characters enter a cross together from the same parent, and their factors tend to pass into the same gamete of the hybrid.

From the beginning of the microscopic study of the maturation of the germ-cells, it was tempting to interpret the processes witnessed as the visible means by which factors are segregated. If the number of genetic factors in an animal was never greater than the gametic number of chromosomes we should conclude at once that each chromosome carried one genetic factor. But in fact the genetic factors in most cases greatly exceed the chromosomes in number, yet there must be some correspondence between them, for Professor Morgan tells us that the characters of the *Drosophila* that have so far been investigated, more than a hundred in number, fall into four groups, "the members of each group being linked, in the sense that they tend to be transmitted to the gametes in the same combinations in which they entered from the parents." "A most significant fact in regard to the linkage shown by the *Drosophila* mutants is that *the number of linked groups corresponds to the number of pairs of the chromosomes*," (four in *Drosophila*).

In the discussion of the chromosomes and their influence in sex production, it should be remembered that many insects have an even number of chromosomes in the female and an odd number in the male. Say the female has $2n$ chromosomes, then the male has $2n-1$. At "reduction," during germ-cell formation, when eggs and sperms are made, the eggs get n chromosomes each, but the sperms get either n or $n-1$. Those which get n have thefore a chromosome over and above those which the others get, and this is the X chromosome. Eggs fertilised by this latter kind of sperm therefore have 2 X chromosomes (for every egg before fertilisation has one X chromosome), and they become female. Eggs fertilised by the other kind of sperm without the X chromosome (having $n-1$), contain only one X and become males. The authors state that they consider that "there is direct experimental evidence of such a nature that there can no longer be any doubt that the X chromosomes are the carriers of certain gens that we speak of as sex-linked."

The authors go into the question of "crossing-over" of the chromosomes at the time of the germ-cell formation, when equivalent exchange occurs between pieces of the chromosomes, and although "the genetic evidence forces one to accept crossing-over between the sex chromosomes in the female, that evidence gives no clue as to how such a process is brought about." But they add, "When the homologous chromosomes come together at synapsis it has been demonstrated, in some forms at least, that they twist about each other so that one chromosome comes to lie now on the one side now on the other of its partner. If at some points the chromosomes break and the pieces on the same side unite and pass to the same pole of the karyokinetic spindle, the necessary condition for crossing-over will have been fulfilled."

From their experiments the authors conclude that the Y chromosome ("the mate of the X chromosome in synapsis and reduction") "does play some positive rôle," and "is necessary for the fertility of the male," yet "it has no effect upon sex itself." Equally positive is the evidence that "sex is quantitatively determined by the X chromosome"—two X's determine a female and one X a male. "Sex is determined by the combination of the X chromosomes, and that the male and female combinations are the causes of sex differentiation, and are not simply the results of maleness and femaleness already determined by some other agent."

It seems to be a fact that "mutation" is more frequent in *Drosophila ampelophila* than in most other subjects which have been chosen for experiment. Possibly one factor in this conclusion is the immense number of flies that have come under the eyes of these workers, and another reason may be that the more or less artificial conditions under which they are produced may have led to the unparallelled mutation. Mutations may be of two classes, "mutations through loss" and mutations by "addition." Some quite new characters have appeared, but there is, it is said, no evidence to justify them "in inferring anything whatever in regard to the nature of the change that takes place in the germ-plasm."

The results of experiments with mice compelled Cuénot to the suggestion that more than two factors may stand in the relation of allelomorph to each other. As a confirmation of the correctness of this explanation our authors state that "there are at least two such systems among the factors in the first chromosome in *Drosophila*." The first of these includes the factor for white eyes, that for eosin eyes, and that for cherry eyes, with the allelomorph of these three, the factor for red colour present in the wild fly—a quadruple system. The second system is made up of the factor for yellow (body-colour), and that for spot (on abdomen), with their normal allelomorph the factor for gray in the wild fly—a triple system. It is pointed out that one of the most striking facts connected with the subject of multiple allelomorphs is that the same kind of change is effected in the same organ.

One of the most difficult questions dealt with was the consideration of the character termed "lethal," under which most of the types, if left to themselves with natural conditions, would soon die out. Whatever may be the method of action of these "lethal factors," sufficient study has not yet been given to suggest, but it can be shown "that from among the offspring obtained from certain stocks expected classes are missing, and the absence of these classes can be accounted for on the assumption that there are present mutant factors that follow the Mendelian rule of segregation, and which show normal linkage to other factors, but whose only recognisable difference from the normal is the death of those individuals which receive them." It was found in the experiments that the numerical results could be handled in precisely the same way as are other linkage results.

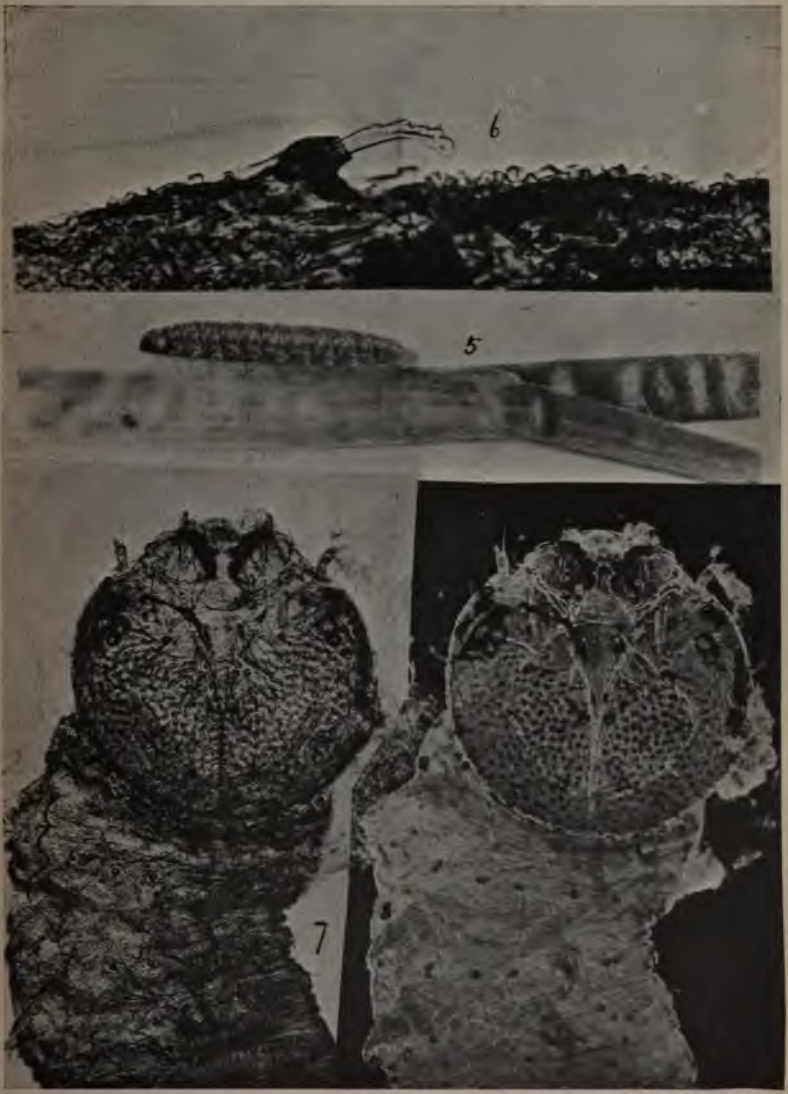
Whilst steadfastly pursuing the main objects of their investigation, the authors were on the *qui vive* for any items which bore on the most important unsolved biological problems. The *Drosophila* appeared to be particularly sensitive to environment in its early stages. In a certain environment, kept uniform, a particular character called "abnormal abdomen" can be induced, which is gradually lost in subsequent generations, when the environment becomes gradually normal, but recurs with the imposition of the former environment. This was repeated several times for many generations of the *Drosophila*. Here then was a character which is readily susceptible to change of environment, yet, apparently, the conditions had no effect whatever on the nature of the germ-plasm, as there was no trace of the abnormality remaining after the altered conditions were removed and the environment became normal. It is claimed from this that "A more striking disproof of the theory of the inheritance of acquired characters would be hard to find." The indirect influence of environment on sex-linked abnormality is also dealt with.

It is suggested that these experiments may afford another explanation of the remarkable cases of polymorphism in animals with more than one kind of female, or male, which Darwin and his followers say might arise through natural selection. A group of characters in *Drosophila* is pointed out as a parallel case to that which occurs in *Colias philodice*, where there is one type of male, yellow, and two types of female, yellow or white, in *Colias eurydice* where the male is orange and the female orange or white, or in *Papilio turnus* where the male is yellow, the female yellow or black.

Among other points dealt with is "Fertility and Sterility in the Mutants," on which the evidence is inconclusive so far.

At any rate the serious charge which was once made against a previous work of the authors that "the material for such an examination is not contained in it," cannot be made here, for the bulk of the book, some sixty pages, is taken up with the data of all the more recent experiments upon which the argument of the authors is based. There are two coloured plates illustrative of the mutant characters of the *Drosophila*, and a Bibliography of what has been published since 1910 on this special line of enquiry.

Results such as those recorded in this work, based as they are upon enormous numbers of individual objects, cannot be ignored as being on slight foundation. We congratulate the authors on the persistent effort which they have so long sustained in a most tedious task, and also more than a considerable meed of praise is due to them for the acumen with which they have perceived the bearing of the results, not only direct, but indirect, on points and questions of biological importance, which were not the special object of their experiment and research. To quote the words of Professor Bateson, "Let it be explicitly said that not even the most sceptical of readers can go through the *Drosophila* work unmoved by a sense of admiration for the zeal and penetration with which it has been conducted, and for the great extension of genetic knowledge to which it has led—greater far than has been made in any one line of work since Mendel's own experiments."—H.J.T.



YOUNG LARVA OF EREBIA ZAPATERI.

Photo F. Noad Clark.

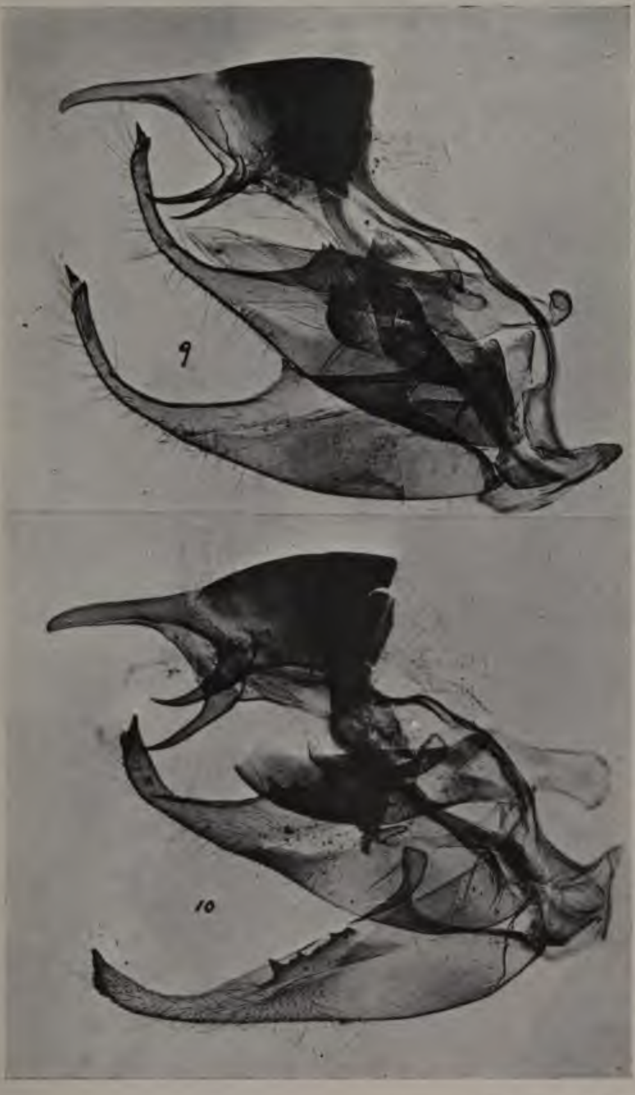


Photo F. Noad Clark

MALE APPENDAGES OF 9 E. ZAPATERI AND 10 E. NEORIDAS × 25.

Dolichoderus (Hypoclinea) crawleyi n.sp., a species of Ant new to Science; with a few notes on the Genus.

By H. DONISTHORPE, F.Z.S., F.E.S.

☿ *Black, shining, sides of clypeus, inner borders and base of mandibles, club of antennæ, base of joint of funiculus, and apex and base of scape, anterior border, and posterior border narrowly, of pronotum, base of epinotum narrowly, tarsi, apex of tibiæ and trochanters, yellow. Antennæ, legs, and whole body furnished with pale yellow outstanding hairs; gaster with white decumbent pubescence.*

Head rugose and wrinkled, together with mandibles, triangular; *clypeus* convex, coarsely wrinkled; *frontal area* distinct; *mandibles* triangular, with large widely separated punctures, and many teeth on terminal border; *antennæ* with scape thickened towards apex; *eyes* high on sides of head. *Thorax* rugosely wrinkled; *pronotum* unarmed, flat on disc, rounded at sides; *mesonotum* higher than pronotum; *epinotum* unarmed, rounded, more rugosely wrinkled and pitted than rest of thorax, with declivity somewhat scooped out and much smoother. *Scale* of pedicel viewed from side conical, triangular, rugosely punctured; *gaster* short broad oval, finely punctured. *Long.* 4·5-4·8mm.

♀ *Mandibles, clypeus, cheeks, mesonotum, scutellum, and metanotum pale yellowish white; a longitudinal stripe on centre of mesonotum and on the parapsidal furrows brown; gaster and rest of body yellowish brown; pilosity and pubescence as in* ☿. (*Probably immature.*)

Head shape and puncturation as in ☿. *Thorax* smoother; *mesonotum* high and convex; *scutellum* very prominent and raised; *epinotum* rounded, convex, with white decumbent pubescence. *Scale* shape as in ☿, but not nearly so rugose; *gaster* smooth, short broad oval, but less round than in ☿. *Long.* 6mm.

Described from 12 ☿☿ and 1 winged ♀ from Singapore, given to me by my friend Mr. E. E. Green. They were associated with species of *Lecanium* (Coccids) in hollow stems of *Macaranga*.

I have named this species in honour of my friend and colleague, Mr. W. C. Crawley.

D. (*H.*) *crawleyi* comes in section 15 of Mayr's table of *Hypoclinea* [Zool. Bot. Ges. Wien, **20**, 955 (1870)] which contains two species from Borneo—*patens* Mayr and *semirugosa* Mayr; both species are larger, the former is of a reddish-yellow colour and is smoother, etc.; the latter is of a deeper black, duller, and the head and thorax are much more rugose and wrinkled. In some respects it approaches *sulcaticeps* Mayr, but that species is also larger, and has the gaster broadly yellow anteriorly; moreover the clypeus is much less wrinkled, and the frontal area is not clearly defined, etc.

Dolichoderus Lund (tribe *Dolichoderini* Emery, subfamily *Dolichoderinae* Forel), is a large genus consisting of some 63 species, and is distributed over all the tropical and temperate regions of the world, except Africa, Madagascar, New Zealand, Polynesia and Chili. The type of the genus is *Dolichoderus attelaboides* Lund.

The chief characters are as follows:—

☿ Not very variable in size. *Mandibles* triangular, toothed. *Maxillary palpi* 6-jointed; *labial palpi* 4-jointed; *antennæ* 12-jointed; no *ocelli*. *Thorax* deeply impressed between mesonotum and epinotum. *Pedicel* with a scale, which is sometimes spined; *gaster* not overhanging pedicel; *anus* not visible from above. *Gizzard* without calyx, or cylindrical portion, and with a not very definite bulb.

♀ Anterior *wings* with two closed cubital cells, and one discoidal cell. Not much larger than, and resembling ☿ in general.

♂ *Antennæ* 13-jointed, scape a little longer than the second joint of the funiculus, first joint of the funiculus very small. *Genitalia: stipites* massive, *volsellae* variable. *Wings* as in ♀.

The genus is divided into three subgenera thus :—

1 Mesonotum longer than broad .... subg. *Dolichoderus* Lund.
— Mesonotum at most as long as broad.............. 2.
2 Scale furnished above with an angle or a spine ; pronotum nearly always bispinous, or biangular..subg. *Monacis* Roger.
— Scale unarmed ; pronotum rarely bispinous ..subg. *Hypoclinea* Mayr.

The species described above belongs to the subgenus *Hypoclin* Mayr. The type of *Hypoclinea* is *Formica quadripunctata* L., which i the only species of *Dolichoderus* found in Europe. There are som 46 species of *Hypoclinea* known, of which 4 are Holarctic, 1 Neotropical, 7 Australian, 2 belong to New Guinea, and 20 to Indi and the Malay Archipelago.

The species of *Dolichoderus* possess variable habits. The Europea *D. quadripunctatus* lives in small nests under bark of trees and in dea branches, generally running in company with *Colobopsis truncata* an *Leptothorax affinis*. The similarity between it and the *Colobopsis* i probably due to mimicry. It licks the surfaces of leaves on which th honey-dew of Aphids has fallen, and the exudations of flowers an twigs ; but according to Forel it does not attend Aphides—its habits i fact being similar to those of *Leptothorax*. I have taken it in hollo walnut branches in Switzerland, where the *Colobopsis* and the *Leptothorax* also occurred.

Wheeler gives a very good account of the habits of some of th North American species [*Bull. Amer. Mus. N.H.*, **21, 305-19 (1905)**] and these do attend Aphids, as well as licking the surface of leaves etc. ; they are also very fond of insects for food. As in the Europea species they crouch down when frightened, but if the nests are disturbed, they attack the intruder with all their force. Their nests which are concealed beneath herbage, etc., are dug out in the sand.

A certain number of species construct carton nests (*D. attelaboide*, *D. bidens*, etc.), and in the forests of tropical America *D. bispinosu* builds voluminous nests, made of fibres, fastened together with a kind of cement, which are suspended from trees.

Notes on Pararge aegeria var. egerides in S. Devon, 1917.

By Dr. R. C. L. PERKINS, M.A., F.Z.S., F.E.S.

In 1916, having chanced to meet the late Mr. A. E. Gibbs, and finding him particularly interested at the time in the butterfly *Parar* *aegeria* var. *egerides*, I had for some years been struck with the distinctive appearance, or one might say beauty, of some of the early spring specimens. I undertook the breeding of this species, and from time to time submitted specimens, both caught and bred, and notes o these to him.

When exhibiting the results of these experiments at the Sout London Entomological Society in October, 1916, Mr. Gibbs incorporate my observations in his remarks as follows :—

"When I was in South Devon at the end of April and the beginnin of May freshly-emerged females were fairly common, but females appea to have been less in evidence later on. The comparatively few capture by Dr. Perkins in May and up to the middle of June (excepting one two, evidently virgins, freshly hatched specimens) were all kept aliv in cages for eggs. Large numbers of ova were laid by these from t latter part of May till the end of June. The resulting larvæ were fed on growing luxuriant food under natural conditions of temperature. The rate of growth was very slow, and it was not until the 29th of July (though possibly overlooked on the 28th) that the first butterfly, a ♀, emerged.

"On the same day the first second-brood wild female was observed in the lane whence the stock had been procured.

"From the latter part of June till July 29th, the butterfly in a wild state had become very scarce though throughout May and till the middle of June it was extremely common in the lanes. Except perhaps a few worn examples it disappeared in July in 1916, and it may be said that the second brood did not begin to emerge till the end of the month.

"By the end of July and in early August Dr. Perkins had hundreds of larvæ varying in size from those full grown or nearly so to those still very small, or about in the second and third stages. A few butterflies emerged from August 10th to August 17th, from May or early June eggs, but on August 10th most of them were still in the larval stage and many not more than half grown, some smaller still. On August 9th several pupated. Three butterflies emerged from these pupæ on October 1st to 3rd. One of them was a cripple, but the other two are rather small and peculiar specimens. These were bred indoors. The pupæ are dimorphic, a beautiful clear green or brown.

"On September 12th and following days the butterfly was found in great numbers in some of the lanes behind Paignton, many of the specimens being very fresh and perfect. About the same date some of both sexes were bred from early August pupæ. The females were put in cages and wild males with them to obtain fertile eggs. Ova were laid by these females till the end of the month but many of them were destroyed by predaceous insects or bad weather, the last butterfly dying about October 1st, after exposure to several nights of violent rains. The first caterpillar emerged from these eggs on October 5th, and half a dozen or more on the following morning.

"On the 3rd of October the grass on which the eggs were laid was dug up, potted, and placed in the open window of a loft.

"The conclusions at which Dr. Perkins has arrived from his observations and experiments during the present year are exceedingly instructive. No very early (March) specimens such as occur some years were seen in 1916, but the first brood of *egerides* appeared without any break or diminution in numbers from early spring till the middle of June. There is little doubt that all of these belonged to one brood derived from eggs laid the previous year. A distinct gap was then observed in the occurrence of the butterfly and it was not until the end of July that fresh specimens appeared. The fact that many of the eggs laid in the latter part of May and beginning of June did not become butterflies till September 12th to October 3rd, while hundreds of larvæ less advanced than these and only half grown in the second and third week in August were thrown away for want of facilities for rearing them, renders the idea of a third brood in 1916 impossible. It seems unlikely that most of these larvæ could possibly have produced any butterflies till next year. It would appear then that in 1916, so far from being three-brooded, *egerides* has been probably only partially double brooded, for it is extremely unlikely that the latest laid eggs of the first brood have yet produced butterflies, or that they will do so. It is to be presumed that the young larvæ, from the eggs of the first brood, which were flung out about August 15th to 20th, would have hibernated as larvæ or pupæ, or some in one stage and some in the other. The continuous succession of perfectly freshly hatched butterflies from early spring till the middle of June would indicate the hibernation of individual larvæ of very different growths, or of larvæ and pupæ. It appears to be extremely likely from these 1916 observations that *egerides* sometimes takes the full year, or about that time, from egg to imago.

"Dr. Perkins draws my attention to another interesting point which I should like to mention. It appears to be the case that while the second brood males are normally and on the average darker than the first brood, it is the reverse with the females, which are on the whole brighter in the second brood.

"These experiments by Dr. Perkins are exceedingly useful and we are very thankful to him for undertaking them and for giving us the results of his work. They go a long way towards clearing up many obscure points in the life-history of this butterfly, in the south-western districts of our island, and we look forward with much interest to his further observations on the brood which will result from the late summer and autumn laid eggs, some of which are now (October) hatching out."

In order to continue the breeding a limited number of eggs was obtained in September from several females of the second brood. It was thought advisable to have a few eggs from each butterfly rather than a full supply from one or (as I had had in the summer) an excessive number from many parents. Only about four dozen eggs were kept and as the weather was excessively stormy the young larvæ were removed later from the open to the window ledge of a loft, the window being always kept partly open. During the autumn and winter growth was very slow, but not even when the water outside was frozen hard, and skating was possible for a week or more close to the sea-shore, was feeding entirely suspended. When the sun shone on the grass, which was grown in flower pots, some of the young caterpillars were distinctly seen to be eating on more than one occasion during the severest weather.

In March seven of the largest caterpillars were brought into a glass house (unheated), the temperature of which on sunny days rose to 70° or even higher still. The first pupa was formed on April 3rd, another a few days after, but others not until two weeks later, by which time some of the larvæ in the loft window had also fixed themselves for pupation. The first butterflies appeared in the glass house on May 3rd and 4th.

On May 6th there were about 40 pupæ in the cages in the loft window and a few caterpillars were still feeding. The last imago from these emerged on June 12th, the first on May 15th. In all 48 examples were bred (26 ♂ and 22 ♀) and excepting two pupæ destroyed by some carnivorous creature in one of the cages I believe practically every egg must have produced a perfect butterfly. No species is easier to rear or gives less trouble. It may be said that the eggs from which the butterflies emerged (from May 3rd to June 12th) were all laid during four days, but, as stated, were from several parents.

Now as to the wild specimens in the spring of 1917. An isolated and imperfect ♀ caught on April 21st was clearly a straggler, but on April 30th several fresh examples occurred in a lane, and on May 5th there were plenty. These therefore either appeared earlier or at least on the date of the earliest of my slightly forced, bred examples, *i.e.*, those reared in the grape house, and 10 days to three weeks earlier than the first of those bred in the loft window.

But at the time my caterpillars were feeding in March on thriving grass plants grown indoors, the grass in the lanes, owing to the severity of the winter, was in very poor condition, and could not have afforded sufficient nutriment to have brought larvæ to maturity. It is, I think, certain that these butterflies had emerged from pupæ of the preceding year and not from hibernated larvæ. The imagines when put beside my bred ones are at once seen to be quite distinct in appearance.

Consequently in the spring we find two forms of *egerides*, one appearing earlier and paler in colour produced from hibernated pupæ, the other later and darker from hibernated larvæ.

It was interesting to compare the time of appearance of these two spring forms in the same localities in the wild state. This being a late year the first of the early and pale form, as stated already, appeared on April 21st, while it was well out on the 30th and very common on May 5th. The first example of the later and darker form was seen on May 26th and was abundant on June 4th, on which date only a few faded examples of the paler form were seen. It remained in good condition throughout the month.

My bred specimens of the darker form were naturally earlier owing probably partly to the slightly higher temperature in my loft than outside and partly to the well grown fresh grass on which they were fed, such not being procurable out of doors.

It was interesting to notice that in the Bovey district, where the cold was considerably greater than near the sea, in one locality where *egerides* had been seen in abundance in 1916, not a green blade of grass was to be seen along the roadside in the early spring of 1917 owing to the abnormal winter, and later the result of this was seen in the diminutive size of all the examples of the butterfly, when I visited the spot in June. Of a considerable number observed in the hour or two that I was able to spend there, not one approached the average size of the species.

In June (24th and following days) I again kept a few butterflies alive till each had laid a few eggs, so as to compare the results with those of 1916. The caterpillars grew slowly till the latter part of July when many of them one damp, and very sultry day at the end of the month, ceased feeding suddenly and prepared for pupation before they appeared to be quite full-grown. I was expecting another ecdysis. All however produced perfect imagines, though rather below the average in size.

The first pupæ, 28 in number, were taken away with me to Somerset, when I left on August 3rd to be free from professional entomology for some weeks, but about 15 larvæ were left behind in the cages either still feeding or fixed for pupation. These all duly produced butterflies in these cages, which were placed out in the garden, and when I returned home on September 3rd many eggs had already been laid on the grass. Two or three specimens just emerged were preserved.

Of the 28 butterflies that emerged in Somerset from the pupæ taken there, 26 were ♂ and only 2 ♀, but of those left at Paignton there were 5 males and 10 females. Still the disparity between the sexes was evidently much greater than in the spring brood (26 ♂, 22 ♀) The last emergence was on September 3rd and one of these females paired on the following day with a ♂, and began to lay in the afternoon. Copulation lasted from 10 a.m. till 1 p.m. (summer time).

It will be seen on comparison how different from this was the behaviour of larvæ and pupæ of the second brood in 1916, as recorded above.

The two spring forms of *egerides* are of much interest and it is rather surprising to find that the second or summer brood, so far as I know, always resembles the later and darker spring brood, which is the produce of hibernated larvæ. The two forms overlap in their time of appearance. In 1917 the light form appeared on April 21st (in some years I have noticed it as early as March 20th), and was abundant on May 5th, worn and hardly distinguishable on June 4th. The dark form appeared on May 26th and was abundant throughout June, eggs being obtained on June 24th from captured females.

Specimens of the second or summer brood, whether caught or bred, resemble the darker spring brood, but we have not bred from the paler spring form at present. There are four or five distinctions between the two spring forms, none of them perhaps constant, but by considering all it is generally easy to say whether a caught specimen belongs to the paler or darker form. A pair of the pale form caught on May 20th and placed side by side with a pair of the dark form bred on the same date, show the differences distinctly enough.

The frequent disparity between the sexes in number in the field is possibly more apparent than real, for the ♀ differs greatly in habits from the ♂, and is much more wary, often flying into or over a hedge at the least alarm, whereas the ♂ will often continue to course up and down over the same track or settle on the foliage, even though it has been struck at and missed more than once.

It remains to be proved whether examples that hibernate as pupæ always produce the paler spring form of butterfly; and if this is not always the case, the exact conditions under which it is produced. Also, it would be interesting to rear a summer brood from eggs of the paler spring form for comparison with one reared from the dark form.

New and Rare British Cecidomyidæ. I.

By RICHARD S. BAGNALL, F.L.S., and J. W. H. HARRISON, D.Sc.

The following may be regarded as a continuation of our series of records on the British Plant-galls, but as we include many species of *Cecidomyidae* that are not gall-causers we consider it advisable to open a separate series dealing with that group alone.

The family is a large one and of very diverse habits. Some are found in the larval form under bark of trees, in sap, fungi, etc., others are inquiline or commensals in the galls of *Cynipidae*, *Cecidomyidae*, *Trypetidae*, or *Eriophyidae*; several are found in the leaf-sheaths of grasses, rushes and sedges, a few being aquatic; others are predatory upon mites or *Aphididae*, whilst a few are internal feeders in insects belonging to widely separated families of the Hemiptera. Not a few feed on epiphytic fungi, and some are to be found in the spikelets of grasses, the seeds of various plants, or the cones of coniferous trees, etc. A few have been proved to be pædogenetic.

Unless otherwise stated the species are additions to the British fauna.

Janetiella sp.

On thyme; gall like that of *J. thymi*, but produced distally in the form of a beak, the outside weakly pilose, but the lip inside, distinctly pilose.

DURHAM, Stanhope and Penshaw Hill, J.W.H.H.

Macrolabis marteli, Kieff.

On *Hypericum hirsutum*.

DURHAM, Middleton-one-Row, J.W.H.H. Previously known from France on *H. perforatum*.

Arnoldia sp. Houard, 1212.

On *Quercus pubescens*.

DURHAM, West Cornforth, J.W.H.H.

Perrisia aucupariae, Kieff. =Houard, 2907.

Flowers of Mountain Ash (*Sorbus aucuparia*).

DURHAM, Gibside, R.S.B.
NORTHUMBERLAND, Ovingham, R.S.B.
SCOTLAND, North Berwick, R.S.B.

Perrisia acercrispans, Kieff.

On Sycamore.

DURHAM, in a dene near Fencehouses, on one tree only, R.S.B.

Perrisia loti, Kieff. =Houard, 3622.

Leaflet of *Lotus corniculatus* folded in the form of a pod.

DURHAM, Gibside, apparently rare, but I have recollections of having seen the gall before, R.S.B.

Perrisia sp.

The following is a fuller description of the species found on *Pimpinella saxifraga*, Penshaw Hill:—Leaflets folded, more or less thickened, more noticeable in the younger ones, which are also discolored, ranging from yellow to red. Larvæ white to creamish-white, gregarious. R.S.B.

Perrisia rhododendri, Kieff.

On *Rhododendron ferrugineum* in a moraine garden at Linthorpe, near Middlesbrough.

Perrisia sp. Houard, 3776.

On *Lathyrus pratensis*.

Leaflets strongly hypertrophied, thickened and coriaceous, folded in the form of a pod. Larvæ white.

DURHAM, Fatfield, R.S.B.

Asphondylia ononidis, F. Lœw.

On *Ononis repens*.

NORTHUMBERLAND (Vice-county 68), Warkworth, R.S.B.
DURHAM, on the coast between Horden and Hart, R.S.B.

Hormomyia arenaria, Rübs.

At base of stem of *Carex arenaria*.
NORTHUMBERLAND, Bamburgh, two examples, R.S.B.

Hormomyia frireni, Kieff.

DURHAM, Gibside, on *Carex binervis*, R.S.B., and Birtley Fell, on *C. flava*, J.W.H.H.

Monodiplosis liebeli, Kieff. (*Schizomyia sociabilis*, Rübs.)

Living in the galls of *Macrodiplosis*.
NORTHUMBERLAND, Ovingham, with *M. volvens*, R.S.B.
DURHAM, Gibside, with *M. dryobia*, R.S.B.

Phaenobremia sp.

DURHAM, West Cornforth; larvæ feeding on *Aphis mali* on apple, J.W.H.H.

Aphidoletes abietis, Kieff.

DURHAM, Gibside, larvæ in galls of *Adelges abietis* on spruce, R.S.B.

Endaphis perfidus, Kieff.

An endoparasite of *Aphis platanoides* on Sycamore.
NORTHUMBERLAND, Warkworth, R.S.B.

Endaphis sp.

An endoparasite of an Aphis on *Ononis repens*.
DURHAM, Penshaw Hill, R.S.B.

Thurauia sp.

DURHAM. Very fragile larvæ and cocoons in leaf-sheaths of *Carex goodenowii*, partly submerged in water, Waldridge Fell, R.S.B.

Two species of this genus are known, *T. aquatica*, Rübs., and *T. uliginosa*, Rübs.

Mycodiplosis sp.

DURHAM, Billingham. On the æcidia of *Uromyces junci* on *Pulicaria dysenterica*, orange-red, J.W.H.H.

Mycodiplosis sp.

DURHAM, Waldridge Fell. On *Puccinia major* on *Crepis paludosa*, larvæ orange-pink, R.S.B. and J.W.H.H.

Phaenolauthia cardui, Kieff.

In galls of *Trypeta cardui*.
DURHAM. Larvæ found in the galls of *Trypeta cardui*, at Edmondsley and Penshaw, are presumably referable to this species.

Contarinia ononidis, Kieff.

Internodes of *Ononis repens* shortened.
NORTHUMBERLAND (Vice-county 68), Warkworth, R.S.B.
DURHAM, on the coast between Horden and Hart, R.S.B.

Contarinia sp. Houard, 5288.

On *Galium verum*.

SCOTLAND, North Berwick.
NORTHUMBERLAND, Bamburgh, R.S.B.
DURHAM, Penshaw Hill, R.S.B.

Clinodiplosis betonicae, Kieff.

In *Betonica officinalis*, flower remaining closed.
NORTHUMBERLAND, Ninebanks, J.W.H.H.

Clinodiplosis rosiperda, Rübs.

Known on the Continent from *Rosa centifolia*.

DURHAM, on *Rosa villosa*, Lamesley and Billingham, J.W.H.H.

NORTHUMBERLAND, Ovingham, on *R. villosa*, R.S.B., and Ninebanks, on cultivated roses, J.W.H.H.

Oligotrophus alopecuri, Reut.

In spikelets of *Alopecurus pratensis*.

NORTHUMBERLAND and DURHAM. Apparently widely distributed and locally common. Records from the three Vice-counties, R.S.B. There is a previous British record.

Cecidomyid sp. Larvæ white.
Cecidomyid sp. Larvæ white, red at each end.

DURHAM, Waldridge, larvæ in leaf-sheaths of small species of *Carex*, R.S.B.

Cecidomyid sp. Houard, supplement, 7372.

A curious thornlike swelling in the stems of *Galium verum*. First described by Cotte from France.

SCOTLAND, North Berwick, Berwick Law, and Tantallon Castle, locally plentiful.

DURHAM, isolated examples on Penshaw Hill, R.S.B.

Cecidomyid sp.

Fusiform, fleshy erect galls, standing about 1·5mm. high, inner cavity well-defined, containing a minute yellow (chamois almost) larva. Found on the upper surface of median nerve of leaf of *Achillea millefolium*.

DURHAM, Hart, about a dozen examples on one small leaf, August 4th, 1917, R.S.B.

Cecidomyid sp.

On *Thalictrum dunense*. Petioles and folioles shortened and thickened, forming a more or less spongy gall. Larvæ gregarious, white. Almost certainly Houard's no. 2443 on *T. minus*.

SCOTLAND, North Berwick, R.S.B.
NORTHUMBERLAND, Warkworth, R.S.B.
DURHAM, coast near Hart, R.S.B.

Cecidomyid sp. *a*.
Cecidomyid sp. *b*.

On *Astragalus hypoglottis*.

a. Stipules, petioles, and folioles shortened, aborted, forming a "bud-gall" about the size of a cherry-stone; inclined to be pilose. Larvæ creamish-yellow.

b. Flowers (sometimes dwarfed) remaining closed, slightly swollen; larvæ white with creamish or sometimes pinkish tinge.

SCOTLAND, Links at North Berwick and at Tantallon Castle, R.S.B.

Cecidomyid sp.

A minute deepish yellow larva in the seed of *Poa*.

NORTHUMBERLAND, Ninebanks, J.W.H.H.

Cecidomyid sp.

Bright yellow to golden-yellow larvæ in the spikelets of Cocks-foot grass (*Dactylis glomerata*).

DURHAM, Penshaw, R.S.B.

(*To be continued.*)

SCIENTIFIC NOTES AND OBSERVATIONS.

ICHNEUMONS VERSUS THE PIERIDS OF OUR CABBAGE-PATCHES.—Quite a deal of comment and anxiety have been excited in our quiet locality by the prevalence of vast numbers of larvæ of the common *Pieridae* (*brassicae* and *rapae*) in our fields and "cabbage patches." At a time when all possible efforts are being made to increase food production, the visitation does seem unfortunate. But how quickly nature steps in to restore the balance. On one side of my tarred fence, 33 paces long, I count at least 200 of these larvæ, whose efforts at completing their life cycle have been frustrated by the attacks of their foes, and which now either brood over the piled up cocoons of their parasites, or have already fallen away shrivelled and dead. Amongst this mass of failure I count 2 pupæ of *P. brassicae*. This examination refers only to the inside of the fence. The outside, exposed to the road, has attracted the attention of passing children and others, who have employed themselves destroying the yellow clusters, under the common impression that they are the ova of the next brood of butterflies. On this outer side I can, however, still count one pupa of *P. rapae*, with the remains of, perhaps, half a dozen more which have been destroyed. There are still dozens of larvæ climbing about, seeking a resting place, but I assume they have no better chance than their brethren. I may note that while sweeping hedges and herbage for Micro-lepidoptera, during the whole season, I have been continuously struck by the numbers and variety of the *Ichneumons* which I have found in my net.—C.R.N.B.

PIERIS BRASSICÆ VERSUS ICHNEUMONS.—In my small garden at New Cross, late in August, I found larvæ of the "large white" feeding on the Nasturtium. Of these forty-nine and one larva of *P. rapae* were put into a cage and supplied with food. The result is that I have forty-nine apparently healthy pupæ of *P. brassicae* and one of *P. rapae*, not one having been attacked by a parasite. Most of the larvæ were nearly full grown when collected. This seems rather remarkable compared with the evidences of other observers, who all agree that the great bulk of the larvæ of the "whites" this year have succumbed to the attacks of parasites. I may say that a solitary larva of *P. brassicae* of a previous brood, taken in the early summer, produced a Dipteron. —H.J.T.

ABNORMAL UNION.—On August 19th I took *Polyommatus icarus* ♂

in cop. with *Agriades coridon* ♀. They were left on the breeding ground, and I wonder what will be the outcome next season. There were very few males of *A. coridon* about at that date, but the females were in countless numbers.—C. P. Pickett, Royston.

Another Abnormal Union.—While staying at Royston last August I met with a somewhat similar occurrence to that described by Mr. Turner on page 182. I very carefully watched two male *Coenonympha pamphilus* waltzing around a female. After a time they both paired up with this lady-love and the usual quiet period followed, so I did not disturb them. After about half an hour I killed them, thinking they would remain in this position until I returned home, but unfortunately they gradually parted. But of one thing *I was certain.* They were both *in cop.* I examined most carefully.—C. P. Pickett.

NOTES ON COLLECTING, Etc.

Sphinx convolvuli in Cumberland.—A specimen of this moth was taken in the town of Brampton, Cumberland, on September 6th. It flew in at the window in the evening. Unfortunately before it was brought to me it was damaged by its captor.—George B. Routledge. [Since the above was written records of five further specimens of *A. convolvuli* have come to hand, all taken at the end of August or the beginning of September.—G.B.R.]

Butterflies in Cumberland.—The three species of "white" butterflies have been fairly common this year. Also *Euchloë* (*Anthocharis*) *cardamines*. I have heard of one *Vanessa io* being seen. It is now very rare in the county; about fifty years ago it was fairly common. I have also seen *Pyrameis atalanta* and one *Pyrameis cardui* on August 21st. *Rumicia phlaeas* during August and September has been common this year.—George B. Routledge. *September* 17*th*, 1917.

Argynnis cydippe (adippe).—With reference to Mr. Turner's note in the *Record* this month, I took a similar variety of the above in the Woking district this season. On each underside forewing two of the black spots have small pearl centres, and parallel with the two black spots, and just touching, are two whitish spots of equal size.—S. G. Castle Russell.

Agriades coridon and Plebeius ægon.—The name *roystonensis* is a misnomer for the form of gynandromophous female first noted from Royston. I have this season taken a similar form in Wiltshire and have also heard of others being taken in the Chilterns. The form is not peculiar to *A. coridon*, as pointed out by Mr. H. Moore, and I in July last took a considerable number of similar gynandromorphs of *Plebeius aegon*, the wings on one side being shot with blue and smaller than those on the other side. It is obvious that a varietal name should be given for this particular form of gynandromorph.

It is interesting to note that the females of *Plebeius aegon* were taken among colonies in which females prepondered over males at least 100 to 1. At Royston, in the season when the so called *roystonensis* occurred in numbers, a similar excess of females occurred. *Plebeius aegon* has been exceedingly abundant this season, but although I have examined them in Cheshire, Kent, Hants and Surrey, it was only in one locality in the last named county that the gynandro occurred, and where the male did not, as usual, predominate.

With reference to Mr. Turner's note on the drinking habit of *Agriades coridon* I have noticed during every season that the males are attracted by horse, sheep, dog, and human excrement when it is fresh, and also where a cart has passed through manure, leaving a rut partly filled with water. The males only are attracted, and I have never noticed a female among the crowd. neither have I noticed the habit among other species of "blues."—S. G. Castle Russell.

Copulation of Agriades coridon, Polyommatus icarus and Agriades thetis.—On September 2nd, at Gomshall, I took a male *Agriades thetis in cop.* with a female *A. coridon*, and a male *Polyommatus icarus in cop.* with a female *A. coridon*. This illicit copulation may account for the colour variation of some of the "blues." An attempt to obtain ova from the pairings unfortunately failed owing to the accidental escape of the insects by means of an unnoticed hole in the leno. It is such an unusual occurrence to find butterflies of different species copulating that I think records should always be made when such is noted. I have on two occasions found *Epinephele jurtina* (*janira*) and *Aphantopus hyperantus* paired, the male in each case being *E. jurtina*. The season generally has been extraordinarily good as regards butterflies, principally I think because of the fine weather. From the middle of May to the 28th July I experienced only one wet day, every excursion being blessed with ample sunshine. After the end of July, the less said about the weather the better, but I noticed that the change occurred at the time of the great offensive on the West front.—S. G. Castle Russell, Woking. *September 18th.*

The Larvæ of Eupitheciids, etc.—A long walk in the district between Bookham and Ranmore Common, over ground familiar when actively collecting years ago, has reminded me that now is the time to gather seed heads of various plants for the seed-feeding larvæ. Coming across a larger number of stems of the "nettle-leaved bell-flower," *Campanula trachelium*, than I have met with for many years, induced me to gather a quantity of the seed-vessels, which on examination produced the larvæ of *Eupithecia campanulata*. This particular locality is another of those paths in Surrey to which I have referred before. as being allowed by the local authorities, if there be any, to get into disuse, so that probably it will be absorbed by the adjoining landowners without a protest, and another "bye-path" in the pleasant Surrey uplands lost to the nature-lover for ever.—H.J.T.

Things that fly.—After the alarming experiences of last night, September 24th, when the air and sky seemed to be full of things propelled or self-propelled, it has been a bit of a relief to the tired brain to contemplate the visitors to my *Sedum* bed, which annually, at this season of the year, attracts most of the beauty in the insect world which has not yet gone to sleep. To-day, a lovely sunlit day, warm and calm, save for the pulsating detonations of distant guns, I find my flower-bed is very fully populated. *Pyrameis atalanta* is the most numerous, truly by the dozen, and, except when bird, or cat, or boy has tampered, in prime condition. *Aglais urticae* comes in a good second, *Vanessa io* but a single specimen, and *P. cardui* one. It is five years since I have recorded this last species, and the probabilities are that I have not seen it in the intervening period. *Pieris brassicae, P.*

rapae, and a few *P. napi*, are also drawn, and a good many *Plusia gamma*, which fairly revels in the hot sunshine. "Humble-bees" and numerous Diptera add to the general liveliness of the scene, but not even one "Hive-bee"—for all our honey bees are dead (of Isle of Wight disease)—and no new swarms have succeeded in filling up their place. I must not forget to mention one solitary wasp—just one—for wasps, which we can well do without, are also it would seem in a bad way this year. I almost expected to see *Sesia* (*Macroglossa*) *stellatarum*, which is a rare visitor to this neighbourhood for some unknown reason, but it has not turned up. I last saw it also in 1912.—C.R.N.B. *September* 25*th*, 1917.

ABUNDANCE OF LIMENITIS SIBILLA.—The abundance of *Limenitis sibilla* in this neighbourhood in July was remarkable. As many as twenty were taken on the 7th of that month in an hour or two by our friend and neighbour, Mr. Gilbert Humphrey. Most of them were released. Numbers more could easily have been captured. They were in company with *Dryas* (*Argynnis*) *paphia*; also common.—JOSEPH ANDERSON, Chichester.

COLIAS EDUSA AT CHICHESTER.—*Colias edusa* has occurred here; but so far as I know only sparingly. A male was flying in our garden on September 11th, when many *Pyrameis* (*Vanessa*) *atalanta* and *Aglais urticae* were to be seen, attracted by the flowers in the borders. Two males of *Colias edusa* were taken on September 27th, in a clover field in this neighbourhood; the last captures probably, on account of the change of weather, of the season.—JOSEPH ANDERSON. *October* 4*th*, 1917.

NOTES FROM THE EASTERN COUNTIES.—On September 27th, during a walk along the edge of the cliffs from Clacton to Walton, I noticed that butterflies were very abundant, and especially was this the case with *Rumicia phlaeas* and *Pyrameis atalanta* during the whole of the distance. I also saw four *Colias edusa*, several *P. cardui*, and a good many *Aglais urticae*, also a fair number of "whites." I don't ever remember meeting with so many *P. atalanta* before in one day: they flew past us every few yards, and *R. phlaeas* was quite the commonest insect to be seen. Here, at Chelmsford, *P. atalanta* are more plentiful than they have been for many years past. One *Vanessa io* was seen flying at Clacton on October 2nd.—E. MILLER (MISS), The Croft, Rainsford Lane, Chelmsford, Essex. *October* 4*th*, 1917.

CURRENT NOTES AND SHORT NOTICES.

The *Transactions of the Cardiff Naturalist's Society* for 1916 have recently been received, and are a record of steadily continued local activity in various branches of Natural Science. Mr. H. M. Hallett, F.E.S., has contributed a "List of the Hemiptera of Glamorganshire," with short notes on the occurrence of well over two hundred species. Hitherto only sporadic records of captures have been made, and no serious attempts to investigate this section of the local fauna. The writer has collated these few records with his own and added those kindly furnished to him more recently by Messrs. Bacchus, David, and Tomlin. Mr. Hallett has also furnished "Entomological Notes" in other orders. He reports the year as being a good one for Aculeate Hymenoptera and as being very free from the plagues of the garden pests. An interesting note on *Pararge aegeria* is, "This butterfly appears to be decreasing in numbers in many parts of the country; so far this does not appear to be the case in this district, it is plentiful in suitable districts in the neighbourhood of Cardiff."

Scarcely a month passes but some record, in the shape of a pamphlet with figures, sometimes coloured, reaches us from the active pens of Prof. P. J. Parrott and his able co-workers in the New York Agricultural Experiment Station. *Technical Bulletin* no. 56. "The Leaf-weevil, *Polydrusus impressifrons*," deals with one of the species imported from Europe, which so often become irrepressible pests in the new circumstances of the Western Hemisphere. This beetle "feeds on a large variety of plants, apparently manifesting a choice for willows, poplars, and birches. In its native habitat (Central Europe) the insect has attracted only slight attention." Eggs are laid under loose bark, dead stubs, and about scars or wounds. The larva seeks the roots, where it subsists all the winter from the hatching in June and July. The beetle emerges in the spring and does a large amount of damage by nibbling the developing buds, the young foliage, and all succulent tissue, such as newly unfolded leaves and stalks of terminal growths. There are six plates and six figures in the text, including a figure of the Braconid parasite, *Diospilus polydrusi*, which is reported as having become quite abundant in recent seasons, and as already beginning to exert considerable repressive influence. The full life-history of the beetle had until recently not been thoroughly investigated. This has now been accomplished and here recorded by Messrs. Parrott and Glasgow. *Bulletin* no. 431 consists of further "Studies on the control of Newly-hatched Aphides," by Messrs. Parrott, Hodgkiss and Lathrop, with a coloured plate and several figures. This is a detailed and statistical report of the effects of various spraying practices for the protection of apple orchards, together with new points in the knowledge of the life-histories of the Aphides concerned, mainly the newly hatched nymphs of *Aphis sorbi*, *A. avenae*, and *A. pomi*.

Signior Querci writes to say that "notwithstanding the difficulties of the present moment" he intends to continue his "entomological research work in Italy," and in order to do so is disposing of sample series of specimens, with excellent data, collected in the mountains of Central Italy. These he will send on approval on application sent direct to him at Via Bolognese 49, Firenze, Italy.

Mr. G. B. Routledge, F.E.S., of Tarn Lodge, Headsnook, Cumberland, writes to say that for some time he has been at work at the Aculeate Hymenoptera and the Hemiptera of Cumberland, with a view to the publication of county lists. He would be pleased to receive any information as to local records and captures from our readers and their friends.

The *Ent. News*, somewhat late in coming to hand, for April contains a description of a Recently-patented Collecting Net, which is made of a flexible-metal frame with a non-collapsible insect chamber covered with thin gauze, the remainder of the net being of the ordinary material used. It is claimed as being advantageous when collecting at light. The remaining articles are mainly descriptions of new species of Diptera, Hymenoptera, Arachnida, Blattidae, Odonata, and a List of Additions to the Insect Fauna of New Jersey. There are three plates.

The May number of the *Ent. News*, also contains a considerable number of descriptions of new species in various orders. There is an interesting and useful article by Hy. Skinner on "The Genus *Parnassius* in America," with a plate of figures of imagines, and a page of bibliographical notes. The writer recognises four species of the genus *P. clodius*, *P. smintheus*, *P. eversmanni*, and *P. nomion*, and discusses the various forms which have been named. Mallock records a hermaphrodite of *Andrena cressoni*. The Orthopterous genus *Panchlora* is discussed by Hebard. T. D. A. Cockerell writes on parasitic bees. There is a comprehensive article on the stem and root-boring species of the Lepidopterous genus *Papaipema*, which is closely allied to our Noctuid genus *Gortyna*. In referring again to the completion of the great work, the *Biologia Centrali Americana*, excellent portraits of the two authors, Dr. F. Ducane Godman and Mr. Osbert Salvin, are given.

In the *Naturalist* for August we read of a caterpillar plague in South-West Yorkshire and elsewhere. Mr. B. Morley, of the Yorkshire Naturalist's Union, reports that there were "incredible numbers" of the larvæ of *Charaeas graminis* in all the uplands of the former district, it being "quite impossible to walk about without killing some at every step." *Plusia moneta* is again recorded from Yorkshire.

In the *Entomologist* for August Mr. R. South has commenced a List of British *Noctuidae*, as arranged in the general collection at the Natural History Museum, with references to the current British works on the family. Whether we agree or not with the Hampsonian Nomenclature, this will be a most useful compilation for all workers in this section of the British fauna.

In the *Ent. Mo. Mag.* for July is an article by W. H. T. Tams, comparing the races of *Euplexia lucipara* from the British Isles and from North America, with illustrations of the respective imagines and their genitalia. The writer wisely leaves the matter for further investigation, with more material and under more advantageous circumstances. At the same time he points out that "there are quite a number of species of *Noctuidae* in North America which are represented in Europe, either by the same form or by closely allied species, and it would pay any keen naturalist to investigate these relationships to the fullest extent, taking into account superficial characters, genitalia, and life-histories." In the same number, Dr. R. C. L. Perkins continues his critical "Notes on the Collection of British Hymenoptera formed by F. Smith."

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

June 28th.—NEST OF ICARIA SP.—Mr. H. Moore exhibited the nest of a wasp, *Icaria* sp., from Demerara.

LIVING C. DISPAR VAR. RUTILUS AND OVA OF TWO SPECIES OF SAWFLY.—Dr. Chapman, a pair of living *Chrysophanus dispar* var. *rutilus*, naturalised in Britain for three generations, and also specimens of the egg-laying of the sawflies *Cladius viminalis* in the petioles of poplar, and of *Lophyrus pini*, in a groove in needles of *Pinus sylvestris*.

SICILIAN COLEOPTERA.—Mr. Main, living beetles from Sicily.

A RARE HETEROPTERON AND LARVA OF S. FAGI.—Mr. West (Greenwich), the rare Heteropteron, *Calocoris alpestris*, from Cumberland, and living larva of *Stauropus fagi* from the New Forest.

COLEOPHORID AND PSYCHID CASES.—Mr. Bunnett, larval cases and living imagines of *Coleophora palliatella* from Crohamhurst, and cases with an imago of the Psychid known as *Fumea casta*.

EXHIBIT OF EUROPEAN CŒNONYMPHA SPECIES.—Mr. Turner, varied series of *Coenonympha iphis*, *C. arcania*, and *C. satyrion*, including several of the named forms, and summarised the current opinion as to the specific value of the three.

NOTES ON THE PRESENT SEASON.—Remarks were made by several members on the season. *Colias edusa*, *Vanessa io*, and *Pyrameis atalanta* had been seen, and larvæ of *Celastrina argiolus*, and second broods of *Pieris rapae* and *P. napi* were reported.

July 12*th*.—ABERRATIONS OF C. VARIABILIS.—Mr. Ashdown exhibited a long series of aberrations of *Coccinella variabilis* taken this year in Surrey.

LIFE-HISTORY OF C. PALLIATELLA AND EXHIBIT OF A RARE BOOK.—Mr. Turner, the life-history of *Coleophora palliatella* on oak, and parts 1, 2, 3, 4, and 7 of the rare book Thunberg's *Dissertatio Entomologica Ins. Suecica*, 1784-94, all dealing with Lepidoptera.

ABERRATIONS AND A GYNANDROMORPH OF C. MINIMUS.—Mr. Frohawk, a series of *Cupido minimus* from Coulsdon, Surrey, showing much individual aberration, including an asymmetrical example which appeared to be gynandromorphic.

NEW FOREST COLEOPTERA.—Mr. West (Greenwich), Coleoptera taken recently in the New Forest, including *Elater lythropterus*, *E. minutus*, *Pyrochroa coccinea*, *Tomoxia biguttata*, etc., the last species around the burrows of a wasp.

ABERRATIONS OF E. ATOMARIA AND P. ICARUS.—Mr. Barnett, varied series of *Ematurga atomaria*, and of females of *Polyommatus icarus*, from near Coulsdon, Surrey.

DIMORPHISM IN P. POLYTES.—Mr. Edwards, a series of *Papilio polytes*, and remarked on the dimorphism expressed in continental and island forms.

PSYCHID LARVÆ.—Mr. Bunnett, newly hatched larvæ of *Fumea casta*, and a living example of *Porthesia similis* which emerged from a pupa the cocoon of which was surrounded by a number of the cocoons of an *Ichneumon*.

REPORTS ON THE PRESENT SEASON.—Mr. Leeds reported that *Chattendenia w-album* was out at Monkswood on June 24th; Mr. Frohawk, *Argynnis aglaia* in Kent on June 25th, and *Aglais urticae* common at Horsley on June 17th; and Mr. Pearson *Argynnis paphia* and *Limenitis sibilla* in numbers in the New Forest.

THE BREEDING OF THE WATER-BEETLE D. MARGINALIS.—Mr. Main described a successful method of getting the larvæ of the Coleopteron *Dytiscus marginalis* to pupate in confinement.

REVIEWS AND NOTICES OF BOOKS.

PROCEEDINGS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, 1916-17. 134+xv. pp. 2 plates.—Quickly time passes, despite the tremendous world-events which are happening. Perhaps it is because of these that the clock and almanack seem thus to race along. But so another year has passed, and once more the *Proceedings of the South London* come before us for review.

As last year, perhaps even more so this, the success of the Society gives cause for the greatest satisfaction. In spite of all difficulties, losses, absences, and preoccupations, the effect upon the membership has been but little, only 163 against 172 of last year. As five have been removed by death, and three have resigned, the adverse balance is but small. Owing to the restrictions upon paper, and the extra cost of production and labour, the pages and plates are reasonably fewer in number, but both paper and execution leave nothing to be desired. The statement of the Honorary Librarian, that the sales of *Proceedings* "show a large increase on previous years," goes to suggest that there is an increasing interest in the publication outside the membership.

The President's address has rather staggered the Reviewer, than whom, probably, no more unpoetic person exists. It speaks well for Mr. Turner's erudition, and painstaking investigations, and we quite agree that it is in place in a Natural History Society's Proceedings. We rise from the perusal comforted and encouraged, for if the "Immortal Bard" so studied entomology, and to such good purpose, we may surely take courage, and subdue our false shame when the untutored hind giggles and guffaws, as our hoary head emerges from our once bright green net. Perhaps, even, it is well to remember sometimes, that we are not the earliest observers of Nature.

Mr. R. Adkin's paper on "*Ocneria dispar* in Britain" is very welcome. The question and the doubt about the species are not by any means new, and it is as well to have so clear a statement as to how the case stands. How many of our cabinets have no space at all allowed to it? How many still proudly exhibit the wretched little, generally deformed, offspring of the imported egg? The point of interest appears to be the peculiar, and as yet unexplained, power which this insect sometimes seems to possess of adapting itself to certain conditions, and thriving therein, *possibly for a time only*. Its appearance in quantity in the Fen district, many years ago, and its wonderful and destructive hold upon districts in North America, to which it was introduced by accident, are to be set against its virtual disappearance from its old haunts in Britain. For, the scanty and widely separated records of its capture here of late years, make it very difficult to believe that it has any real footing at the present time. To the writer, who 50 years ago bred large numbers of the imported race, and turned out hundreds in all sorts of places within a few miles of Wanstead, it has become a matter of sincere thankfulness that he was spared, owing to the peculiar character of the insect, bringing untold trouble and expense upon his country.

That *O. dispar* will not, as a matter of course, repopulate even a locality in which it once prospered, is indicated by the rumour, believed to be well founded, that many years ago a deliberate attempt was made to replace it in the Norfolk Fens, and that, although it managed to linger on for a few years, it has long since disappeared. At any rate it is quite evident that it has not spread. One would like to know, while on this subject, the true origin of some large specimens which were rather sparingly circulated in exchange, a few years since by an energetic amateur collector, now deceased, and guaranteed to be of the original British stock! The carriage of the young larvæ by the wind would explain the extension of its sphere of activities, but scarcely its disappearance from its old localities.

The paper on "The Genus *Pararge*," by the President, will be of great value to those who interest themselves in the larger study of whole groups, or big genera. Again one feels a little dazed by the enormous amount of time and concentration necessary for the production of such a mass of references. The moral of the note seems to be that there has been (and will still of necessity be) a great deal too much energy expended upon giving varietal names, based upon small differences, confessedly a great temptation to those who specialise in one particular line. A further note by the President, introducing an exhibition of and discussion upon *P. aegeria*, and yet another on the same species by Mr. E. A. Gibbs, make the volume quite an epitome of information on this species.

The successful rearing of *Geotrupes*, unpleasant though the task must have been at times, is another triumph for Mr. Main. In these investigations the essential matter is usually "how to do it." That discovered, success depends upon patience and care. Mr. Main shows that he grasped the "how" when he evolved his breeding cage.

Mr. Turner's wonderful discovery of a quantity of Stainton's *Tineid* material is worthy of a place amongst the Romances of Entomology. It is a curious speculation as to how and when these valuable specimens found their way to Nunhead, and how it came to pass that they were so nearly lost to science.

The mention and exhibition of a new Geometrid previously unknown, by Mr. L. W. Newman, cannot be passed over unnoticed. This insect thus suddenly thrust upon us, was discovered by the Rev. J. W. Metcalf, of Ottery St. Mary, and is named by him *Cidaria otregiata* (after the ancient name of his town), in the *Entomologist* for April, 1917. It should be noted that the genitalia *do* differ, though it be but slightly, from those of its near relative *C. suffumata*. The difference is quite sufficient to satisfy one, who like the writer, believes thoroughly in the evidence of these organs, as to the specific distinctness of the new insect.

Mr. Moore's note upon *Agriades coridon* ab. *roystonensis*, Pickett, will we think commend itself to all collectors. In a word—with all due respect to our old friend who introduced the name—*roystonensis* "is nothing more than a set of cripples." In the same connection we would suggest that "gynandrous" is scarcely a proper term to apply to the completely female specimens of this species, although they possess not only the male coloration of the wings, but even some of the androconia. These are after all but secondary sexual characters. "Gynandrous" is already used—if we are not mistaken—as an abbreviation of "gynandromorphous." Whether the abbreviation be justifiable or not, "gynandrous" would certainly imply the existence in one individual of, at least parts, of the primary organs of both sexes.

Greatly will the "Sixth from Adam"—we fancy he used to call himself the "seventh"—be missed in the entomological world. Investigating, discovering, popularising, our science for over 40 years, Fred Enoch leaves indeed a large gap in our ranks which it will be hard to fill. He was so "solid." The writer possesses a few of his mounts of insects, magnificent mounts they are too, which must have been made quite 40 years ago.

It is sad, too, to read so frequently in these pages the name of our friend E. A. Gibbs, and to remember that he also has been taken from us.

The exhibits have been quite up to the standard of previous years, and the field meetings, though not very productive in captures, must have done their part in keeping up the life of the Society.—C.R.N.B.

BARNES AND McDUNNOUGH'S CHECK LIST OF THE LEPIDOPTERA OF BOREAL AMERICA.—Through the kindness of Dr. Barnes and Dr. McDunnough, I have received an advance copy of this most useful work, which enumerates 8,495 species of Lepidoptera as at present discovered in that region.

The one thing that I regret is the continued refusal to recognise as valid Hübner's *Tentamen*. It appears to me that, having regard for article 25 of the International Code of Zoological Nomenclature, we are bound by that code to accept the *Tentamen*. The article says:—

"The valid name of a genus or species can be only that name under which it was first designated on the condition:

"*a*. That this name was published and accompanied by an indication, or a definition, or a description; and

"*b*. That the author has applied the principles of binary nomenclature."

The British Association Committee stated that two conditions were necessary before accepting as valid any name, *viz.*, "definition and publication."

It will be seen that by the insertion of the word "indication" in "*a*" of article 25 of the code, the International Commission has taken a somewhat wider view than did the British Association Committee, and in view of this it appears to me to be quite impossible to ignore the *Tentamen*. It has been averred that it is a mere list of "nomina nuda," and that it has never been published. As regards publication, if any of Hübner's books can be considered to have been published, this must be so considered. We must remember that Hübner had, apparently, his own printing press, and issued his books himself to his patrons, being his own publisher. There can be no doubt now that the *Tentamen* was issued as a single sheet with a part of his book (vol. v.) then in course of publication, probably at the end of 1804 or early in 1805. (The Cambridge Zoological Congress decided on the date 1806.) What evidence is available however? First of all we have Ochsenheimer in 1816 (*Schm. Eur.*, iv., p. viii.) regretting that he had not seen the *Tentamen* in time to avail himself of its names in his previous volume (iii.). That he knew the list is evident for he states it was issued in 4to. form. In addition to this we have in the preface to the *Verzeichniss* (1816), Hübner's own express statement that he drew up ten years before the *Tentamen* for his own purposes, and that he immediately made it known. There is no ambiguity about the statement, for he gives the exact title word for word, and I accept this as decisive. Then we come to the assertion that it is a mere list of "nomina nuda." In the *Tentamen* we have the Family name, the generic name, and one species in each case. We thus have the indication, quite distinctly, as required by the code. There can be no question whatever as to what is meant, and in addition all the species were figured. Practically all entomologists accept the names of Felder's Heterocera, if we accept the one I consider we should accept the other, I admit the two cases are not precisely in the same category, as in the one case the names and figures were published simultaneously, this being not so in the other case, but against this is the fact that all of Hübner's *Tentamen* names referred to very well known species, and every lepidopterist who was at all "au fait" with the subject knew well what insect Hübner was then referring to, and more important still, *they referred to figures that he had already published*, and I am constrained to say that this one fact makes the "nomina nuda" theory absolutely untenable. In thus considering the validity of the *Tentamen*, I am seizing the opportunity of raising the whole question again, rather than using it to criticise the value of the Check List so generously sent to those who have given any little help in elucidating uncertain points.

By way of criticism there are one or two things that call for remark. For instance, I notice that Chamber's extraordinary spelling is perpetuated, I must admit that I always write *Polyommatus coridon*, which if corrected should be "*corydon*," and it is very difficult to decide where corrections should begin or end, but when the genitives are almost invariably formed incorrectly, I almost think the grammarian might step in. Article 19 of the Code does not, however, allow of the emendation of names, except in the case of a "lapsus calami," or an evident typographical error; the question might well be raised again in the International Sub-committees.

The family *Aegeriidae* set me thinking, and I wonder whether the authors have not seen the most recent writing in the *Biologia Cent. Am.* on this group, or whether having seen it, they disagree, one could wish in the latter case that reasons had been given in the preface. There has been a considerable rearrangement of genera in the Microlepidoptera comparing it with Dyar's list, and this is probably all to the good; Dyar closed his work with the Micropterygoidea, which included the *Hepialidae* and the *Micropterygoidae*. Our authors make them into two independent families, and this is no doubt the correct view.

It was as recently as November last that McDunnough wrote a very important paper on alterations in many of the Noctuid genera and their types, these have all been incorporated in the present Check List, and will no doubt be adopted by most of the specialists of that important section of the science.

We are grateful for the general "get up" of the list, the printing is very clear, and if the spacing is not as liberal as it was in Dyar's work, yet the type is so clear that there will be no difficulty in rapidly finding the object of one's search, whilst the index is excellent, the good practice of putting the family and generic names in bold black type having been followed. The region dealt with is America, north of Mexico, and there is an addition of nearly 2000 species since Smith's list of 1904.

The work is a valuable contribution to all Lepidopterists, and I cannot but recognise the usual generosity of our fellow workers on the other side of the silver sea in distributing it so kindly to any who have had the pleasure of aiding in it in however small a way.—G.T.B.-B.

Some Entomological Notes from Egypt and Palestine.

By H. W. ANDREWS, F.E.S.

The following notes on some of the Diptera and other insects observed during the past eighteen months in Egypt and Palestine may be of interest to your readers. They are necessarily of a cursory and indeterminate character, as my duties prevented my leaving the immediate neighbourhood of the various camps at which I was stationed, and I had no collecting apparatus nor books of reference; thus these observations merely refer to the insects I happened to notice in the course of my daily work. Then, too, the fact that such vegetation as chanced to exist in the vicinity of the camps got speedily trodden down was a further handicap to entomological investigation.

I. EGYPT.

On landing in Egypt in February, 1916, I was stationed at a training centre on the outskirts of Cairo. One of the first things that struck me here was the abrupt line of demarcation between the cultivated land and the desert; in fact one could frequently stand with one foot in a field and one on the desert sands. I noticed very few insects here beyond the common housefly and some small *Scarabaeus* beetles. There was a large number of birds closely resembling an English wagtail, very tame, and running about between the lines of tents, and these may have had some effect on insect life. I only saw one or two butterflies, including a "blue" and a Vanessid, during my stay. When visiting the Zoological Gardens, at Gizeh, I saw a few Diptera, mostly *Muscidae* and an Anthomyid, but in no great numbers. After a stay of some weeks at this camp I was moved to the eastern bank of the Suez Canal, and here I remained in various camps, chiefly on the eastern side, for the remainder of my stay in Egypt.

The commonest insects—apart from the ubiquitous houseflies—were various species of dragonflies; these were in evidence during the whole of the spring, summer, and autumn. In all probability they breed in the Sweet Water Canal which runs parallel to, and on the Egyptian side of, the Canal proper for some three-quarters of its course, and which, in addition to the vegetation on its banks, helps to irrigate a narrow belt of cultivated land.* I was but little troubled with mosquitoes on the eastern side of the canal, but other units stationed on the western bank suffered a good deal. Both *Culex* and *Anopheles* were identified at Shallufa. The cultivated land irrigated by the Sweet Water Canal probably afforded favourable breeding grounds. As regards Diptera, I saw a fair number of a species of *Anthrax*, somewhat similar in its wing markings to *A. paniscus*, but a good deal larger. A small Asilid was occasionally met with on the shore. I once or twice saw a Tabanid resembling *Tabanus bromius*, and after a day of violent wind and sandstorms numerous specimens of a small Syrphid were observed on the tents, presumably blown across from the cultivated land on the other bank, as I saw no others on the eastern side. *Syrphidae* generally seemed very scarce; a careful search among some flower beds round the English Church at Suez failed to produce any, and a search among the flowers in Nouzha Gardens at Alexandria, made when on a week's leave in October, was also a blank, though in similar seasonal circumstances at home at least three or four species of *Eristalis* would be seen frequenting the flower heads. The only other *Syrphidae* I can recall to mind were, firstly, some specimens of a *Melanostoma* (*mellinum* or *scalare* ?) seen round about some dandelions in a waste portion of a park at Ismailia, towards the end of January, 1917—the numerous flowering plants and shrubs in this park being devoid of insect life; and secondly, several specimens of a *Syrphus* in the reed beds bordering lake Menzaleh, the biggest of the Egyptian lakes situated alongside the northern portion of the Canal. On one of the few occasions I was able to get away from the camp I noticed an Acalypterate Muscid (? a *Lauxania*) in abundance on some desert scrub; this fly now and then appeared in camp. On the same occasions I noticed several specimens of a fair sized *Spilogaster*, but *Anthomyidae* as a rule were conspicuous by their absence. An R.A.M.C. orderly told me that *Fannia canicularis* had been found breeding in one portion of the camp, but I did not myself see any specimens. *Musca domestica* was a great nuisance all through the hot weather, and *Stomoxys calcitrans*, in the proportion of about 1 to 50 *M. domestica* was also present. Although there was a certain amount of seaweed and refuse on the shore by the southern mouth of the Canal, I did not see any of the shore-frequenting Diptera that might have been expected. A few Tachinids (*Sarcophagae* ?) were seen now and again.

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* Despite its name, the waters of this canal, also any surface pools or swamp waters, are dangerous to Europeans, as they contain quantities of a minute parasitic worm, which enters the body through the skin or by the mouth, causing a disease called Bilharziosis. In consequence of this all ranks of the B.E.F. were forbidden to drink, bathe, wash, or fish in these waters.

As regards Lepidoptera I only noticed a very few species. A "blue" about the size of the English "little blue" was plentiful in the church garden at Suez. In the autumn I saw several specimens of the humming-bird hawk moth; another hawk moth (*celerio* ?) was brought to me one night in a battered condition from the sergeants' mess, and a fellow entomologist in a neighbouring unit caught two hawk moths resembling our lime hawk, also two Death's head moths and a Danaid butterfly (? *Anosia plexippus*). I also saw a very worn specimen of this species in the Park at Ismailia. A few Noctuid moths and several Microlepidoptera (Deltoids) were attracted by lights at dark. In 1917, when stationed at Kantara, further up the Canal, Lepidoptera were more numerous. *Pyrameis cardui* was frequently seen, also several Pierids and an occasional *Colias*. I was interested to notice several examples of that rare British insect the crimson speckled Footman, *Deiopeia pulchella*. In this camp mosquitoes were occasionally troublesome, especially when the wind blew strongly from lake Menzaleh. I had an opportunity one day towards the end of April of strolling along the margin of the lake. A flowering shrub* attracted numerous small "blues" allied to our *Lampides boetica*, in most cases, but not all, they kept the two little tails on their hindwings in perpetual motion when settled. The only other Lepidoptera seen were one or two Pierids. This was the only opportunity I had to look carefully for Diptera, and I was disappointed to see so few species. I had hoped to see some *Stratiomyidae* and *Dolichopodidae* at least, but apart from *M. domestica* I can only call to mind a *Nemotelus*, a *Haematobia*, and the above mentioned Syrphids. It is possible that later in the season these reed beds may be more prolific, and again there was an immense area here compared with the restricted patches of similar vegetation in my home collecting grounds in the Thames marshes, by Erith or Gravesend, when on any summer's day I would reckon on seeing from ten to twenty times the number of Diptera, both as regards species and specimens.

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* This same flowering shrub attracted the species of *Syrphus* referred to above.

As regards the other orders of insects, I have previously referred to the Dragonflies as the most common, they were also very much in evidence on the margin of lake Menzaleh. Several specimens of a large green Mantis were brought to me for identification, usually accompanied by anxious queries as to their possible stinging propensities. I never saw these *Mantidae* preying on other insects, nor did they take any notice of sundry flies I offered them. Ant-lions used occasionally to be attracted by the lights in the tents. A large black species of cricket was common and very vociferous at night. I had one or two odd specimens of locusts and grasshoppers brought to me. In the Hymenoptera a large and active species of black ant occurred generally. I noticed a small bee (? a mason-bee) on the walls of a native house used as an officers' mess, and at Tanka Station I observed numbers of a large Hymenopteron flying about. It was about the size of an English hornet, but as I was in the train at the time I had no opportunity of seeing one settled, and cannot identify it unless it was the same species as a very handsome wasp that occurred now and again in single specimens in the Canal bank camps.

I saw very few species of beetles, although their tracks were numerous on the sand in the early mornings. At Kantara, in March, a densely hairy species of beetle, resembling a small humble bee, was fairly common, flying about in the hot sun, but it was not noticed after the end of that month. In the same camp, when the wind was blowing from lake Menzaleh, numerous small Hemiptera used to come to lights at night, and when bathing in the canal I several times noticed a small species of Trichoptera floating on the surface of the water. I once came across a *Lepisma* in a hut near the cookhouses.

II. Palestine.

Owing to military reasons not unconnected with the Turk, my experience of Palestine has so far been limited to the undulatory grass-covered country below Gaza, and a belt of palms, figs, and sandhills bordering the seacoast. It was a great relief to the eyes to get away from the constant glare of the desert sands, and to see green hills again, although the grasses were even then (May) beginning to wither. The country had a very homelike appearance, heightened by the presence of certain British birds and wild flowers, *e.g.*, skylarks and poppies, convolvulus, and hawkweeds.

When the British forces first reached Palestine these downs were covered with crops and grasses; as might be expected insect life was much more in evidence here than in the sandy wastes of the Sinai Peninsula. I was told that lots of butterflies and moths were then to be seen, "*cardui* occurring in flights of several hundreds towards the end of April, and *machaon*, *edusa*, and *daplidice* also very common," but by the time I arrived—about the middle of May—they had mostly disappeared. As stated above, the grasses were rapidly withering, and the constant grazing and passage of numbers of horses and camels accelerated this process, so that the countryside soon presented the appearance of an English stubblefield after a very hot and dry summer. Even so butterflies were more plentiful than in Egypt. I caught a fleeting glimpse of a large black and yellow swallow-tail one day soon after I arrived. In a small patch of swampy ground near the coastal sandhills several *Colias* sp. ? could usually be seen; and one or two species of "blues" and Pierids were not uncommon. *D. pulchella* was noted again. By the end of June, however, Lepidoptera had practically disappeared. Ants and grasshoppers were by far the commonest insects: the latter were very abundant, especially a species with vivid crimson underwings, which used to flash up as the insect was disturbed and disappear like magic when it settled again. Two or three other species of grasshopper were also to be seen. A brown mantis, smaller than the large green kind seen in Egypt, was not uncommon. Ant-lions were attracted by lights at night, and I saw one dead specimen of a large species with variegated wings. It was being dragged along by some ants, which were thus having their revenge for their relatives who had doubtless fallen victims in the earlier stages of this ant-lion's existence. Dragonflies were scarce, but occurred every now and again. Among the Hymenoptera ants were by far the most numerous, occurring everywhere. These insects vary so much in size and sex-forms that I hesitate to estimate how many species occurred. The three commonest were a long-legged, very active black species, about half as large again as our forest ants at home, a smaller, but also long-legged, yellow species, with a black tipped abdomen, and a minute yellow species. There also seemed to be at least three or four other kinds, but with shorter legs and not so active as the first two mentioned above. I witnessed a slave raid (?) one day, the raiding party carrying away grubs and pupæ, and also imagines, but I had not time to investigate closely and could not distinguish if the latter were killed or not. A large specimen, paler than the others, seemed to be directing operations, as it did not take any part in the carrying off of the booty, but remained by the entrance of the raided nest unmolested by either side. Among the wasps a slender waisted *Ammophila* (?) was common, and a *Sphex* (?), about the size of an English queen wasp, with yellow black-tipped wings, was constantly to be seen fidgeting about the earthen walls of the bivouacs dug out in the sides of the gullies that run along the valley bottoms. This latter species preyed on grasshoppers, and I was told that the *Ammophila* had also been seen attacking a grasshopper. I saw a species of solitary bee with a black and white striped abdomen, resembling the Dipteron *Catabomba pyrastri*, for which I mistook it at first. One or more species of a smallish black winged Hymenopteron were observed both on the downs and on the sandhills, and a Hymenopteron unknown to me, with a large red body, apparently too big in proportion to its wings, came to light at night once or twice in the camp in the palm belt. I occasionally saw a species of *Mutilla*, which I believe also belongs to the Order Hymenoptera.

A good many species of beetles were observed; a large dung-rolling *Scarabaeus* was common, and the abundance of its special provender, due to the large numbers of horses, mules, and camels, must have led it to believe that the millenium had arrived. A number of these beetles were infested with small red Acari and also with a minute

Dipteron. *Cicadidae* made nearly as much noise here by day as the black crickets did in Egypt by night. These crickets also occurred, but sparingly. A species of firefly also occurred. I did not see this insect myself, but a senior N.C.O. told me that during one of the "strafes" he saw what he at first took to be the glowing tip of a cigarette in a gully, but on proceeding to find out who and where the culprit was he found no one, and subsequently saw several other "insect cigarettes" of a like nature.

As regards Diptera, the house fly was ever with us, but not quite such a pest as in Egypt; *S. calcitrans* also occurred sparingly. I recognised a *Philonicus* (*albiceps?*) on the sandhills, a *Neoitamus* on the downs as well as two or three species of *Asilus*, or closely allied genera. I was not fortunate enough to see them with prey at any time. A silvery *Thereva* (*T. annulata?*) was seen on the sandhills, but was not common, also an *Anthrax* of the *circumdata* group. A single specimen of a non-British genus allied to the foregoing was observed on the sandhills. I do not know its name, but recognised it from the wing veining as figured in Mr. Verrall's volume on *Stratiomyidae*, etc. This was the only species of Diptera seen either in Egypt or Palestine that I was unable to refer to British (or closely allied) genera. Sundry species of Tachinids were noticed both on the sandhills and the downs, but I cannot recollect seeing any *Anthomyidae*. A small Syrphid (*Sphaerophoria* sp. ?) was not uncommon on a hedge surrounding a palm grove. Single specimens of a Tipulid, a Dolichopodidid and a *Hippobosca* (?) complete my record to time of writing.

In conclusion I may here mention certain general features that seem to me to stand out as a result of my observations. Firstly, the meagre total of species observed; secondly, with certain exceptions, the equally meagre number of specimens of any one species; and thirdly, as regards Diptera, the fact as stated before, that I only saw one species I could not place in a British or closely allied genus. I know it is unwise to generalise on insufficient data, and probably a collector with time at his disposal would find a far greater number of species. Personally I am inclined to account for the first and second points mentioned by the limited opportunities I had for entomological pursuits and the sterile localities in which I was camped, at any rate during my stay in Egypt. As to the third point, the absence of non-British genera, I suppose that one has to get beyond the desert area to find other than Palæarctic species in any abundance.

One other matter of interest was the extraordinary abundance of the housefly, despite stringent sanitary precautions carried out under military rule, and the apparent absence of favourable breeding opportunities. Its persistence under these conditions gives one some idea of the terrible pest it must be where no sanitary precautions are taken. In one camp it was discovered to be breeding actually under the incinerators where camp refuse was burnt daily. This was due to the fact that some of the refuse had been allowed to accumulate, and the space under the incinerators had not been kept absolutely clean, although it would be thought that the heat from the burning refuse, about a foot off the ground, might have been sufficient to kill off any larvæ: but the fact remains to show the care necessary to clear up absolutely all refuse that can by any chance, or in any place, afford a breeding ground. In addition to strict orders as to burning of rubbish, and disposal of horse manure, fly papers, and later on wire gauze fly killers, were issued to the troops, but these weapons seemed to make but little impression on the numbers of this insect foe. One other point was that *M. domestica* occurred practically all the year round, though somewhat less frequently in the winter months, and did not, as in England, wait until May or June to come out in any considerable numbers.

Coleoptera in the Worthing District.

By H. DONISTHORPE, F.Z.S., F.E.S.

Having spent nine weeks at West Worthing (from May 31st to August 2nd) this year, I was able to put in a certain amount of collecting, and the following paper is the result as far as the Coleoptera are concerned. As there do not seem to be many records from this part of Sussex, it seems as well to publish a complete list of all the beetles I captured, whether common or otherwise, with a few notes on the rarer species, or anything of interest.

Excursions were made to various parts of the Downs, such as Findon, with its early English Church, half way up the down; Chanctonbury, crowned on top with a grove of beeches—the celebrated "Chanctonbury Ring;" Highdown, with the tomb of the eccentric Miller on the down, and fine woods at the back; Lancing Clump; and Cissbury with its Ring, and the remains of the gigantic earthworks of the ancient fort of Cissa; etc.

Cissbury is a most delightful place for a day's excursion; here butterflies were abundant, especially the "Dark Green Fritillary" (*Argynnis aglaia*); and I captured a specimen of the "Leaden Footman" (*Lithosia sericea*). Towards the end of my stay "white" butterflies occurred literally in thousands at West Worthing.

I have used the following abbreviations for the different localities where beetles were captured:—Cissbury = "C"; Findon = "F"; Goring = "G"; Great Salvington = "GS"; Goring Woods = "GW"; Lancing = "L"; Sompting = "S"; West Worthing = "WW."

I must thank Dr. Cameron and Dr. Sharp for naming *Homalotas*, and Mr. W. E. Sharp for kind help with some of the critical species of other genera.

Amara bifrons Gyll. "WW": *Harpalus rupicola* Stm. "WW"; *Tachypus flavipes* L. "G"; *Dromius meridionalis* Dj. "WW." *Dromius* sp?, under bark of a very old Tamarisk tree at West Worthing. This insect belongs to the subgenus *Calodromius* Reitter, of which *4-rinotatus* Pz. is the type. It comes nearest to that species, but differs in having an entirely black thorax, which is very much narrower than in *4-rinotatus*; the puncturation of the head and thorax is also closer, etc., etc. It does not agree with any other species in the European List, but as I only took a single specimen, it is best perhaps not to describe it as a new species. *Brachinus crepitans* L. "C"; *Helophorus brevipalpis* F. "C"; *Aleochara lanuginosa* Gr. "WW"; *Drusilla canaliculata* F., with *D. niger* at West Worthing, etc. *Homalota cambrica* Woll., *H. splendens* Kr., and *H. hepatica* Er., these three nice species were all taken by sweeping on the Downs at Findon. *H. fungicola* Th. "GW"; *H. analis* Gr. "S"; *H. boletobia* Th. "GW"; *H. nigra* Kr. "WW": *Bolitobius lunulatus* L. and *B. exoletus* Er. "GW"; *Mycetoporus splendens* Marsh. "F"; *Ocypus olens* Müll. "WW"; *O.*

cupreus Ross. “WW”; *O. pedator* Gr., half a dozen specimens were taken by turning over stones on a salt marsh on the edge of the shingle at West Worthing. *O. compressus* Marsh. “WW”; *Philonthus micans* Gr. “G”; *Gabrius pennatus* Shp. “F”; *Cafius xantholoma* Gr. “WW”; *Xantholinus punctulatus* Pk., and *X. ochraceus* Gyll. “WW”; *Achenium depressum* Gr. “WW”; *Stenus erichsoni* Rye “F”; *Platystethus arenarius* Fourc. “GW”; *P. cornutus* Gr. “WW”; *Oxytelus insecatus* Gr. “WW”; *O. nitidulus* Gr. “WW”; *O. sculptus* Gr. “S”; *Cyrtusa pauxilla* Schm. “WW”; *Choleva cisteloides* Fröh. “F”; *Catops sericatus* Chaud. “GW”; *C. sericeus* Pz. “WW”; *Bryaxis helferi* Schm. “WW”; *Sericoderus lateralis* Gyll. “S”; *Scymnus frontalis* F. “C”; *Saprinus virescens* Pk., swept in a field of sainfoin at Lancing. *Micropeplus margaritae* Duv. “WW”; *Epuraea longula* Er., swept at Lancing Clump. *Pria dulcamarae* Scop. “WW”; *Meligethes difficilis* Heer. “S”; *Corticaria elongata* Gyll. “G” and “F”; *Atomaria linearis* Steph., *A. atricapilla* Steph., and *A. berolinensis* Kr. “WW”; *Byrrhus fasciatus* F. “WW”; *Lucanus cervus* L. Tarring. *Hoplia philanthus* Füss. “F”; *Rhizotrogus solstitialis* L. “WW”; *Lacon murinus* L. “F”; *Athous longicollis* Ol. “C” and “WW”; *Dascillus cervinus* L. “F”; *Telephorus fuscus* L. “F”; *T. lividus* L. ab. “WW”; *Rhagonycha fulva* Scop. “WW”; *Malthodes minimus* L. “C”; *Psilothrix nobilis* Ill. “C”; *Drilus flavescens* Ross. “F”; *Ptinus fur* L. “WW”; *Priobium castaneum* F. “F”; *Anobium domesticum* Fourc., Sompting, beating a hedge; it was very abundant in my house at West Worthing, and I captured its parasite, the Chalcid *Cerocephala formiciformis* West., emerging from its burrows in an old oak wardrobe. *Cis bidentatus* Ol. “F”; *Lema cyanella* L. “GW”; *L. melanopa* L. “S”; *Cryptocephalus pusillus* F. “GW”; *Phaedon tumidulus* Germ. “F”; *Sermyla halensis* L. “C”; *Longitarsus luridus* Scop. “GW”; *L. waterhousei* Kuts., abundant on a very large bush of *Solanum dulcamara* at West Worthing; *L. exoletus* L. “G”; *L. succineus* Foud., on a few plants of *Reseda* at Cissbury; *L. ochroleucus* Marsh. “WW”; *Haltica oleracea* L. “C”; *Phyllotreta nodicornis* Marsh. “C”; *P. nigripes* F. “C”; *P. atra* Pk., and *P. cruciferae* Goez. “S”; *Apthona venustula* Kuts. “F”; *Crepidodera aurata* Marsh. “GW”; *Apteropeda orbiculata* Marsh. “C” and “F”; *Cassida fastuosa* Schal. Goring Woods, all the specimens taken occurred on flea bane and were of a bright yellow and black colour; as this variety does not appear to have a name I propose that of *flava* n. var. for it. I may mention that though freshly emerged they were quite mature, moreover, I kept some of them alive for a long time. Ragwort is the plant given for this species, and Bedwell took it on Ploughman's Spike-nard (*Inula conyza*) at Box Hill. *C. viridis* L. “GW”; *Lagria hirta* L. “L.” *Salpingus ater* Pk. (?), by beating Tamarisk blossoms at West Worthing. This is certainly not the species we call *aeratus* Muls. It is more convex and robust and quite black, as are also the legs and antennæ. *Oedemera nobilis* Scop. ab. “L”; *O. lurida* Marsh. ab. “GW”; *Nacerdes melanura* L., abundant in and about the sea-breakers at West Worthing, also at Worthing and Lancing, varying considerably in size and colour. *Anaspis maculata* Fourc. pale ab. “WW”; *Apion nigritarse* Kirb., on Tamarisk blossoms “WW”; *A. tenue* Kirb., on Melilot, “WW”; *Exomias araneiformis* Schr.? Five specimens were taken in a small pit on the downs at Findon.

This is probably a new species, the specimens are narrow than any specimens of *araneiformis* I have seen. *Tanymecus palliat* F. "WW"; *Sitones waterhousei* Walt. "GW"; *S. meliloti* Wal "WW"; *S. puncticollis* Steph. "GW," "WW," and "L"; *Hype punctata* F. "WW"; *H. polygoni* L. "WW"; *H. plantaginis* De "F"; *H. trilineata* Marsh. "F"; *H. nigrirostris* F. "GW"; *Lipar coronatus* Goez. "G" and "GS"; *Orchestes alni* L. v. *ferrugine* Marsh. "G"; *Miarus campanulae* L., this species occurred in son numbers at Findon in a small buttercup on the Downs, and not i *Campanula*, its usual food-plant. *Anthonomus rubi* Hbst. "WW' *Coeliodes cardui* Hbst., and *C. 4-maculatus* L. "F"; *Ceuthorhynch pleurostigma* Marsh. "F," "S," etc. *Ceuthorhynchidius floralis* Pl "G"; *C. horridus* F. "C"; *Balaninus villosus* F. "F"; *Codiosom spadix* Hbst., in sea-breakers at West Worthing.

New and Rare British Cecidomyidæ. II.

By RICHARD S. BAGNALL, F.L.S., and J. W. H. HARRISON, D.Sc.

(Continued from page 210.)

Lasioptera sp.

Amongst seeds of *Carex viscaria*. Larva bright salmon coloured.
DURHAM, Billingham, J.W.H.H.

Lasioptera calamagrostidis, Rübs.

Under leafsheaths of *Phalaris arundinacea*.
DURHAM, Birtley, J.W.H.H., Gibside, R.S.B.
NORTHUMBERLAND, Warkworth, R.S.B.

Neocerata rhodophaga, Coquillet.

Larvæ of a Cecidomyid taken in the buds and flowers of cultivate roses at Ninebanks, Northumberland, are possibly referable to thi species, J.W.H.H.

Baldratia salicorniae, Kieffer.

On *Salicornia radicans*.
DURHAM, Greatham, rare, J.W.H.H.

Stefaniella brevipalpis, Kieffer.

Stem gall in *Atriplex* (*Obione*) *portulacoides*; rare.
DURHAM, Greatham, J.W.H.H.

Mayetiola sp.

On *Bromus erectus*.
DURHAM, Gibside, R.S.B.

? *Perrisia glyciphylli*, Rübs.

On *Astragalus hypoglottis*.
SCOTLAND, Forth area, R.S.B.

Perrisia ulmicola, Kieffer.

Gall on *Ulmus*, analogous with *P. pustulans* = Houard Cecid myid 2055.
NORTHUMBERLAND, Warkworth, rare.
DURHAM, Burnmoor, Gibside, Norton.

Aphidoletes sp.

Larvæ entirely red, living in galls of *Adelges strobilobius.*
DURHAM, Gibside, R.S.B.

Xenodiplosis laeviusculi, Rübs.

On gall of *Neuroterus laeviusculi.*
NORTHUMBERLAND, Warkworth.
DURHAM, Fatfield, R.S.B.

Dichodiplosis langeni, Rübs.

On dried plums.
DURHAM, Gibside, R.S.B.

Mycodiplosis sp.

Larvæ yellowish-orange, feeding on *Puccinia hieracii* on *Hieracium boreale.*
DURHAM, Winlaton Mill, J.W.H.H.

Contarinia sp. See Houard, 4408.

Achenes of *Bupleurum tenuissima* inflated by larva.
DURHAM, Greatham, J.W.H.H.

Oligotrophus loewianus, Kieff.

Galling heads of *Carex arenaria.*
NORTHUMBERLAND. Galls local but rather plentiful in one or two spots. Warkworth, R.S.B.

Cecidomyid sp.

Yellow-orange larvæ feeding and pupating under epiderm of stems of *Heracleum sphondylium* growing in marshy places.
DURHAM, Gibside, R.S.B.

Cecidomyid sp. (*? Contarinia*).

Angelica sylvestris, a single ivory-white wriggling larva inflating base of flower; rare.
DURHAM, Billingham, J.W.H.H.

Cecidomyid sp.

Minute rose-red larvæ on dead seed-cases of *Scrophularia nodosa.*
NORTHUMBERLAND, between Warkworth and Alnmouth, R.S.B.

Cecidomyid sp.

Reddish larva feeding externally on what seem to be parenchymatous galls.
NORTHUMBERLAND, Warkworth, R.S.B.

Cecidomyid sp. Houard, 1306A.

On oak.
NORTHUMBERLAND, Warkworth, R.S.B.
DURHAM, Fatfield, R.S.B.
Previously known from Portugal.

Cecidomyid sp.

Flowers of Privet remaining closed, leathery, each containing a solitary, rather large, orange-yellow larva. Not *Schizomyia ligustri*, Rübs.

NORTHUMBERLAND, Warkworth, R.S.B.

Cecidomyid sp. Houard, 4267.

Flowers of *Helianthemum chaemocistus* remaining closed; larva solitary, pinkish-yellow.

DURHAM, coast between Horden and Hart, R.S.B.

Cecidomyid sp.

Semitransparent whitish larvæ, sometimes tinted with dull yellow, under the inner leaf sheaths of *Carex glauca*; gregarious.

NORTHUMBERLAND, Warkworth.
DURHAM, coast between Horden and Hart, R.S.B.

Cecidomyid sp.

Larvæ feeding on mildew on oak, yellowish.

NORTHUMBERLAND, Warkworth, and
DURHAM, Gibside, R.S.B.

Cecidomyid sp.

Larvæ feeding on mildew on rose, yellowish.

DURHAM, Gibside, R.S.B. Was known to Hardy (*Ann. and Mag. Nat. Hist.*, 1850).

Cecidomyid sp.

Larvæ yellow, in galls of a Cynipid, *Andricus fecundator*.

DURHAM, Winlaton Mill, J.W.H.H.
NORTHUMBERLAND, Warkworth, R.S.B.

Cecidomyid sp. (*? P. geranii*).

Yellow larvæ *in* seeds of *Geranium pusillum*.

NORTHUMBERLAND, Warkworth, R.S.B.

Cecidomyid sp.

Red larvæ in closed flowers of *Stachys lanatus*.

DURHAM, Penshaw, J.W.H.H.

Cecidomyid sp.

Larvæ bright rose-red, in leaf sheaths of *Carex flava*.

DURHAM, Birtley Fell, J.W.H.H.

Cecidomyid sp.

On *Geum urbanum*, flower remaining closed; petioles sometimes shortened.

DURHAM, Norton, J.W.H.H., Fencehouses, R.S.B.

Cecidomyid sp.

Larva yellow, in spikelets of *Phleum pratense*.

DURHAM, Penshaw, once only, R.S.B.

Cecidomyid sp.

Larvæ small, pinkish; on dead fungus-attacked seed-cases of *Lampsana*.

DURHAM, Gibside, R.S.B.

(*To be continued.*)

SCIENTIFIC NOTES AND OBSERVATIONS.

ICHNEUMONS VERSUS APANTELES.—On September 15th I found on a fence at Putney a larva (still alive) of *Pieris brassicae*, out of which the larvæ of the Braconid parasite *Apanteles glomeratus* had just emerged and formed their cluster of yellow cocoons, so abundant everywhere this year. I noticed two or three small Hymenopterous insects hovering over and settling on the cocoons, one of which I bottled—it proves to be a ♀ of the Ichneumon *Hemiteles fulvipes* Grav. The caterpillar and cocoons were taken home and placed in a glass-topped box, and on October 8th Ichneumons began to appear, and continued to do so up to October 17th; some 30 specimens in all having hatched out. Of these 28 are *Hemiteles fulvipes* Grav., ♂♂ and ♀♀, and 2 are *Panargyrops pellucidator* Grav., ♂ and ♀, another species of Ichneumon.

Morley [Brit. Ichs. **2**, 123 (1907)] gives a number of hosts for the *Hemiteles*, mentioning that Marshall bred it from *Apanteles glomeratus* upon *Pieris brassicae*. He further writes—"Ratzeburg supposed the *Hemiteles* to oviposit in the larvæ of the *Apanteles* during the few hours they lie exposed, between emerging from their host and spinning their own cocoon; but Brischke says that he took at the beginning of August, 1871, a ♀ *H. fulvipes*, running busily among a mass of *Microgaster glomeratus* cocoons beneath a rose leaf; on the following day the female was dead, and in less than three weeks one ♂ and 29 ♀♀ of *H. fulvipes* emerged from the cocoons. Though the *Hemiteles* themselves are hyperparasitic, they in their turn are destroyed by two species of Chalcids, *Entedon vinulae* and *Pteromalus boucheanus*, to such an extent that Tischbein observed that although all the Microgasters of a brood were destroyed, all the *Hemiteles* except only one shared the same fate at the hands of the Chalcids."

It was fortunate observing the hyperparasites when they were no doubt ovipositing, and in my case the *Hemiteles* must have sought out the *Pieris* larva just after the Braconid larvæ had emerged and formed their cocoons, when the latter would be soft.

Of the other species, *Panargyrops pellucidator* Grav., Morley (*l.c.* p. 105) does not give any hosts, but of the species mentioned just before it, *P. aereus* Grav., he says, according to Brischke, it is always hyperparasitic, upon *Pieris brassicae*, etc. Most probably one of the other Ichneumons I observed hovering over the *Apanteles*' cocoons was a ♀ of the *Panargyrops pellucidator*. I must thank Mr. Morley for naming these Ichneumons.—HORACE DONISTHORPE.

ATTITUDES OF WASPS AND PSOCIDS IN COPULATION.—On September 23rd, about eleven o'clock in the morning, I observed a pair of wasps (*Vespa vulgaris*) *in cop.* at Putney. It was in a road near my house, and my attention was first drawn to them by one of my Pekinese, which was evidently interested in something on the pavement. The ♂ was on the back of the ♀, and at times was dragged along on his back behind her. They were unable to fly properly, only fluttering a short distance and walking. When at rest the ♂'s body was seen to be in regular motion. I twice endeavoured to box them, and eventually they separated and flew off in different directions. It seems advisable to publish this observation, as I am unable to find any reference to the copulation of wasps in any books I have, or have been able to consult.

On October 14th I noticed a pair of Psocids (*Atropos divintria*) *in cop.*

on my table, they were back to back, and ran about both backwards and forwards. I picked them up with a fine paint brush and placed them in a small plaster nest, where they remained *in cop.* for a considerable period.—H. DONISTHORPE.

NOTES ON COLLECTING, Etc.

REAPPEARANCE OF NOTODONTA BICOLORIA.—I read in *The Irish Naturalist* for October, p. 164, the account of the capture of a male specimen of *Notodonta bicoloria* in the Killarney locality, by my friend Mr. L. H. Bonaparte Wyse, on the morning of June 7th last. There is a further vindication, if such were needed, of the veracity of Peter Bouchard—which has suffered much from suspicion in times past, but was ably defended by Edwin Birchall in *The Entomologist* for January, 1867, pp. 192-253. By a somewhat curious coincidence I met Mr. Bonaparte Wyse at Stevens' Sale Rooms, on the same day on which I received the Irish magazine, and we discussed his capture in the presence of one of Bouchard's ancient specimens.—C.R.N.B.

HYDRŒCIA CRINANENSIS IN CO. TYRONE.—Thanks to the Rev. C. R. N. Burrows' kindly help, I am able to record this species as occurring in this locality. Amongst a short though variable series sent to him for identification, amounting in all to twenty-two insects, no less than seventeen prove to be *Hydroecia crinanensis*, the remainder being *Hydroecia lucens*. The former varying from a pale yellow through various shades of red to a dark brown, with either a white or orange reniform ; a series of four from the banks of a small stream flowing into and close to Lough Neagh are almost of an unicolorous light brown, the reniform being of the same colour as the rest of the wing ; another red-brown form has both orbicular and reniform of a bright orange colour. *H. lucens*, on the other hand, hereabouts seems to be a comparatively unvariable species, being of some tone of red or yellowish-red.—THOMAS GREER, Stewartstown, Co. Tyrone. *October 24th*, 1917.

SOME FIELD NOTES FROM NETLEY, HANTS, IN 1917.—As this locality appears to have been very little worked a few random notes may be of interest.

On June 5th full fed larvæ of *Aglais urticae* were common.

On June 15th full fed larvæ of *Eugonia polychloros* were wandering from elm trees in search of a site for pupation.

On June 16th *Platyptilia ochrodactyla* (*bertrami*) were common in several different places around. *Arctia villica* two specimens, *Triphaena pronuba*, *Agrotis exclamationis* and *A. segetum*, with the common Caradrinids, were abundant at rhododendron flowers at dusk.

On June 21st *Dysstroma* (*Cidaria*) *truncata* were common, two colonies of *Zygaena trifolii*, about a mile apart, were fresh, and a full fed larva of *Porthesia similis* was noticed.

On June 24th *Pyrameis atalanta* was seen in good condition.

On June 25th *Collix sparsata* and *Lobophora sexalisata* were common at dusk flying about the sallows in a marshy field. *Crambus pascuellus* and *Alucita pentadactyla* were abundant, as were *Cabera pusaria* and *C. exanthemaria*. At privet blossom *Caradrina alsines*, *C. taraxaci*, *C. quadripunctata*, *Camptogramma bilineata*, *C. pusaria*, *Hypena proboscidalis*, and some Eupitheciids were taken.

On June 26th sugar produced *Xylophasia monoglypha*, *Miana strigilis* two, *Triphaena pronuba*, *Noctua primulae* (*festiva*) some fine forms, *X. rurea*, *Dipterygia scabriuscula* (*pinastri*) common, *Mamestra oleracea* one, *Aplecta nebulosa* several, *Mamestra sordida* one, and *Scoparia ambigualis*.

On June 27th an afternoon walk produced *Aglais urticae* common and fresh, *Vanessa io* larvæ common full fed, *Triphaena janthina*, *Coenonympha pamphilus*, *Limenitis sibilla* fresh, *Augiades sylvanus*, *Pieris napi* only two or three, and larvæ of *Pharetra* (*Acronicta*) *rumicis*. *Asthena candidata*, *Iodis lactearia*, and *Camptogramma bilineata* were beaten out with one *Crambus pinetellus*. Sugar produced *Aplecta nebulosa*, *Dipterygia scabriuscula* (*pinastri*), *Noctua primulae* (*festiva*), *Xylophasia hepatica*, and *Tinea tapetzella*.

On June 28th *Nola cucullatella* and *Stenia punctalis* came in to the light. *Xylophasia monoglypha*, *Triphaena pronuba* common, *Noctua primulae* (*festiva*), *D. scabriuscula* (*pinastri*), and *Miana strigilis* were taken at sugar. A full fed larva of *Taeniocampa stabilis* was found.

On June 30th dusking produced *Leucania pallens*, *L. impura*, *L. conigera*, *L. lithargyria*, *L. straminea*, *Petilampa arcuosa*, *Hepialus hectus*, *Plusia gamma*, and *Lomaspilis marginata* common.

On July 1st *Pieris rapae*, *P. napi*, and *P. brassicae* second brood fresh, were met with. *Bithys quercûs* was also taken. Larvæ of *Eupithecia pulchellata* were common half fed, and *Stenoptilia pterodactylus* (*fuscus*) occurred.

On July 3rd *Zygaena hippocrepidis* two specimens, *Pseudoterpna pruinata* (*cytisaria*), *Adopaea flava* (*linea*), *Augiades sylvanus*, *Limenitis sibilla*, and *Rumicia phlaeas* several, were taken.

On July 5th *Metrocampa margaritaria* was noted. *Xylophasia rurea* two rather worn, *Apamea secalis* (*oculea*), *Aplecta tincta* one, *Habrosyne derasa* one, and *Hypenodes taenialis* (*albistrigalis*) two were taken at sugar.

On July 7th *Aglais urticae* was common and very fresh, other butterflies such as the three *Pieris* and *Epinephele jurtina* (*janira*) were unusually abundant. There were a few *Augiades sylvanus*.

On July 10th *Ptychopoda* (*Acidalia*) *dimidiata* (*scutulata*) and *P. aversata* were met with, while *Platyptilia ochrodactyla* (*bertrami*) were common.

On July 11th *Sesia* (*Macroglossa*) *stellatarum* one, *Ptychopoda* (*Acidalia*) *bisetata*, *Hipparchia semele*, *Eupithecia subnotata*, and *Spilodes verticalis* were obtained.

On July 12th *Epinephele tithonus* first appeared and *Pyrausta purpuralis* was taken, while *Zanclognatha grisealis*, *Dipleurina* (*Scoparia*) *crataegella*, *Leucania pallens*, and *L. impura* occurred at light.

On July 13th I took *Hydroecia nictitans* and *Amphidasis betularia*.

On July 14th *Zygaena trifolii* was nearly over, three *Z. hippocrepidis*, but very worn, were taken. *Gonepteryx rhamni* were just commencing to appear, and I came across larvæ of *Hipocrita jacobaeae*.

On July 15th *Pieris napi* were common in the afternoon, with a few *P. brassicae* and *P. rapae*. I also met with *Endotricha flammealis*, *Eudoria truncicolella*, *Epinephele tithonus* fresh, *Argynnis paphia*, and *Limenitis sibilla* three specimens, while the second brood of *Celastrina argiolus* was just commencing. At dusk several *Ourapteryx sambucaria* were seen flying. In the evening *Hypenodes taenialis* (*albistrigalis*) three, *Triphaena pronuba*, *Gonoptera libatrix* one, *Miana strigilis*, *Apamea secalis* (*oculea*), *Cymatophora duplaris* three, *Thyatira batis* one, *Xylophasia rurea*, *Leucania pallens*, and *Calymnia trapezina* were taken at sugar.

On July 17th *Porthesia similis*, *A. secalis*, and *Geometra papilionaria* came to light.

On July 21st *P. similis* was met with as imagines, ova and cocoons. The larvæ of *Hipocrita jacobaeae* were now full fed, and larvæ of *Apatela* (*Acronicta*) *aceris* were found.

On July 23rd light in the huts produced *Hydroecia nictitans* common, *Pseudoterpna pruinata* three, *Eupithecia assimilata*, *E. oblongata*, *Apamea secalis*, *Endotricha flammealis*, *Eurrhypara urticata*, *Platyptilia ochrodactyla* (*bertrami*), *Leucania litharygyria*, and *Dianthoecia cucubali*.

On July 25th I found *Xylophasia lithoxylea* on tree trunks, *Bithys* (*Thecla*) *quercus*, the three Pierids very common, *Epinephele tithonus* very common, *Tephrosia crepuscularia*, *Polyommatus icarus* very common, *Ptychopoda* (*Acidalia*) *aversata*, *Crambus warringtonellus* with *C. perlellus*, which was the rarer, and *C. culmellus*.

On July 27th *Cosmotriche potatoria*, *Dianthoecia cucubali*, and *Boarmia gemmaria* came in to light.

On July 28th *Miltochrista miniata* came in the hut to light.

On July 31st I found *Psilura monacha* female on an oak trunk.

Note.—No colony of *Zygaena filipendulae* has yet, September 26th, been noticed in the district, although *Z. trifolii* were very common, and a few *Z. hippocrepidis* among them. The dragonfly, *Anax imperator*, occurs here fairly commonly. Ferns are noticeable for their absence—a great contrast to the Isle of Wight and to the New Forest, both within sight of our mess. [*To be continued.*]—G. S. Robertson (M.D.), Officers' Quarters, Netley, Hants.

Field Notes from Bath and the Neighbourhood.—Though August was a wet month it had some redeeming features from an entomological point of view. On the 2nd the tree trunks in Victoria Park were all wet, but a small insect was seen on the mud, I cannot describe the ground better, at the foot of a birch, when boxed it turned out to be *Argyresthia goedartella* ab. *literella*. Very few specimens of this aberration have been recorded. Maple abounds here in the hedges, and there are also many trees in the fields and woods, but it was not till this month I saw *Croesia forskaleana* and then less than a dozen specimens. Some mines gathered off elm produced later *Lithocolletis schreberella*, and I have seen here the other elm miner, *L. tristrigella*. Is there any recognisable difference between the mines of these two species? About this time *Œgoconia quadripuncta* was seen sitting on a lime trunk, and only one or two specimens of *Carcina quercana* occurred in the hedges. Three larvæ of *Mimas* (*Smerinthus*) *tiliae* were seen, one crawling down the trunk of an alder, the second on a lime trunk, and the third at the foot of an elm. The 4th was a showery day, and I went into some woods near Bathampton. Very little was about, but two *Cerostoma sequella* were found at rest on the stem of a small maple, and a good specimen of *Asthena blomeri* was observed, rather a late appearance. Searching tree trunks has not yielded very much this year. I have seen two *Boarmia repandata*, one *Tricopteryx* (*Lobophora*) *viretata*, and of course several *Xanthorhoë* (*Melanippe*) *fluctuata* and *B. gemmaria*, besides a few *Scoparia dubitalis*, *Eudoria* (*S.*) *frequentella*, and *S. ambigualis*, but the Torticina and Tineina have not decorated the bark as they do some years. Lithocolletids were quite scarce both in May and August, but their mines are now abundant. On the 7th *Aphomia sociella* was found on an oak. It was resting on the bark with its head raised, looking like a gigantic *Homaeosoma*. The only species which appeared in its usual number was *Batrachedra praeangusta* on the trunks of poplars. On the 10th two fresh specimens of *Argyresthia semitestacella* were obtained from a hedge, just where a large beech stands, near Combe Down. *A. nitidella* has been abundant, *A. albistria* common, and I have taken a few *A. semifusca*. Here, as in my experience elsewhere, the last species always occurs on whitethorn and I believe this to be its food-plant. The next few days were more or less wet, some of them very wet, but the 16th was fine and *Pieris brassicae*, *Vanessa io* and an occasional *Aglais urticae* were revelling in the sunshine while sucking the lilac blossoms of a *Buddlea* bush in Victoria Park. Later in the month *Aglais urticae* was a more frequent visitor and one or two *Pyrameis atalanta* joined in the feast. On this day I saw the first *Teras contaminana*, the herald of a multitude. Not liking the look of the sky the next day, I took a walk through some woods near Bathampton and met with a larva of *Acronicta alni* on a beech trunk. It was seeking a place in which to spin up. When later I gave it a wine cork in which I had made a large hole it took to it at once. On this occasion I saw little else but beat out a few *Crambus geniculeus* from whitethorn. I have often noticed that this species differs from most other *Crambi* in its habit of resting in bushes rather than among grasses. The next day we went for a delightful walk through some very picturesque fields which lead from Glasshouse to Midford. There are some damp spots and the fields look just the places to work in May and June. In the last field there is a stream and a sallow tree and alders on the adjoining Midland Railway bank. Here I took the first *Grapholitha nisella*, a grey form with a black dorsal mark. On the worn out sleepers which guard the railway were a few old cases of *Fumea casta*, and this is the only place where I have seen them here. The only other Psychid noticed here is *Narycia monilifera*, a few old cases in two or three localities. On the 20th I was horrified to see some children with a small green net catching the *V. io* off the Buddlea, already mentioned. They told me they had caught some "peacocks," and a smaller thing. This was *Polygonia c-album*, which I obtained by "exchange." These children came every fine morning, so *V. io* became a rarity on that bush. The next day I went through the fields again to the *G. nisella* spot, and obtained two more. One of these was the ab. *decorana*, and other ab. *rhombifasciana*. *Recurvaria cinerella* was also found, settled on long grass. At Bathford, on the 22nd, *Platyptilia gonodactyla* occurred, and a larva of *Nisoniades tages*, firmly spun up on the edge of a coltsfoot leaf, evidently intended passing the winter in this retreat, when I unfortunately disturbed it. The moth of that afternoon was *Ortholitha* (*Eubolia*) *limitata*, which flew abundantly out of the herbage. On the 27th, *Pyralis farinalis* and *Hepialus sylvinus* were noticed in Bath.—ALFRED SICH. *September 28th*, 1917.

DATES AND RECORDS.—In a garden at Putney I noted the following species first on the dates mentioned. *Pieris rapae*, May 2nd; *Celas-*

trina argiolus, May 3rd; the lace-wing fly, May 27th. At W. Worthing in a garden, *Pyrameis atalanta*, June 4th; *P. cardui*, June 9th; *Sesia stellatarum*, July 29th. On October 2nd a "clouded yellow" (*Colias edusa*) was observed at Putney in the afternoon, near Putney Common. It flew slowly and settled many times, when I was able to examine it closely, finally flying over a wall, when it was not seen again.—Id.

Vanessids in Somerset.—*Vanessa io*, *Pyrameis atalanta*, and *Aglais urticae* have been very, very numerous here this year, especially *A. urticae*. I have only seen two *Pyrameis cardui*, and no *Colias edusa*; but the latter has never been plentiful here.—Waldegrave, Chewton Mendip, Somerset, *October* 13*th*, 1917.

"Somewhere abroad."—We have received a couple of letters from our correspondent and friend Dr. E. A. Cockayne, who is somewhere at the front, though not in France. He says he is "alive and well," though having a good deal of vile weather, nevertheless in the fine days in between he mentions that he has captured *Aporia crataegi*, but no *Crataegus* anywhere near, *Pieris napi* and *P. brassicae*, *Erebia lappona*, a species of *Brenthis*, *Aglais urticae*, *Callophrys rubi*, two species of *Anarta*, and also of *Eupithecia*, *Eulype hastata* var. *hastulata*, one *Xanthorhoë fluctuata*, and *Ematurga atomaria*. He describes the locality as not very fertile and with a good deal of granite. He goes on to say that I am to tell Mr. J. H. Durrant he had a "knot-horn" and a few species of Micros, but that they are few and far between. Perhaps the most noticeable thing is the cloud of mosquitoes, which are so numerous and so persistent that it is impossible to deny their importunity. In another later letter from another locality he writes as follows:—

"I have two flourishing colonies of *Aglais urticae* larvæ sleeved under muslin, and at present I have about thirty pupæ from the original locality, with eight from the present spot, also a large larva of *Papilio machaon*. My list at present is *Pieris brassicae*, *P. napi* ♀ near *bryoniae*, *Colias palaeno*, *Aporia crataegi*, *Vacciniina optilete*, *Callophrys rubi*, *Brenthis pales*, *B. aphirape*, and another *Brenthis* sp., two fritillaries, one of which I saw only on the wing, and thought it was *Issoria lathonia*, *Erebia lappona*, and *E. disa*, *Eulype hastata* var. *hastulata*, *Xanthorhoë fluctuata*, *Coremia* (*Ochyria*) *munitata*, *C.* (*O.*) *ferrugata* (?), *Entephria caesiata*, *Malenydris salicata*, *Ephyra* (*Zonosoma*) *pendularia*, *Pygmaena fusca*, *Eupithecia satyrata*, and *Numeria pulverata*.

"I have seen six species of *Anarta*, the commonest being *A. melaleuca*. There is no doubt I have missed a good deal. Some species only lasted a few days. *Papilio machaon* I have only seen three times, once by a signalman, and but for finding the larva myself I might have doubted it, though his description appeared good enough to establish the butterfly's identity. Please remember me to all my entomological friends."

Dr. Cockayne goes on to give me a most interesting description of the country and its flora, which, however, must be deferred until war conditions have passed away. It is, however, good to have such cheery letters written under circumstances that no one would call the most comfortable.—G.T.B-B.

CURRENT NOTES AND SHORT NOTICES.

In the *Entomologist* for August, Mr. W. J. Lucas gives his annual summary of observations on the "British Odonata." Mr. F. B. Newnham describes a remarkable aberration of *Argynnis aglaia*. "All the wings of the insect, which is a female, are yellow, not brown, while the usual black markings of the upperside are replaced by similar silver markings, which are very bright in certain lights." This aberration is named by the captor as ab. *molybdena*.

Our colleague Mr. R. S. Bagnall, F.L.S., in conjunction with Mr. J. W. H. Harrison, D.Sc., has compiled a "Preliminary Catalogue of British *Cecidomyidae*," which will be published in the *Transactions of the Entomological Society of London* for the present year.

The concluding part of the *Transactions of the Entomological Society of London* for 1916, has just been issued, the whole issue for the year is, as usual, a handsome contribution to the literature of Entomology and we must congratulate the Officers and Council of the Society on its production.

In the *Ent. Mo. Mag.* for August, Command. J. J. Walker describes a 1917 visit to the New Forest chiefly for Coleoptera; Mr. G. T. Porritt writes on the excessive abundance of *Charaeas graminis* in the Peek District; Prof. A. D. Imms discusses the Biology of the same species from the economic point of view; and Mr. E. A. Butler discusses the correction of the identification of the Hemipteron hitherto known as *Aphelochirus aestivalis* to *A. montandoni*.

The *Bull. Soc. ent. France* for June contains the descriptions of three new European species of Ant, *Formica*, by M. J. Bondroit, which he names *F. lemani*, from the mountains of France and Switzerland and the Ardennes (dedicated to the defender of Liège), *F. gerardi* from the Eastern Pyrenees, and *F. tonibeuri* from Portugal, (dedicated to the victorious general in Africa); and M. Charles Oberthür gives an account of the Lepidoptera Heterocera taken at Rennes around the electric arc lamps, and calls attention to the abundance of *Sphingidae*, *Notodontidae*, *Lasiocampidae*, and *Noctuidae*; included in the last family are a number of species which occurred commonly but which are very uncommon generally.

The *Canadian Entomologist* for August contains in its "Practical Entomology" column an account of the Strawberry-root Weevil in British Columbia, and includes a summary of the recent studies of the beetle *Otiorhynchus ovatus*. The control measures given are (1) Rotation of crops, (2) Production of strawberries on the "one" or "two year cropping" plan, (3) The removal of old and infested plantations by ploughing at the end of the egg-laying period. To these a further control is described, that of "burning over" an infested field, but the initial results of this experiment showed that it might be far from thoroughly effective. The remainder of the number is mainly composed of descriptions and notes on new spiders, new and noteworthy Coleoptera of W. Florida, etc., and Notes on Bembecine Hymenoptera from Nebraska.

To the September number of the *Naturalist* Mr. J. W. H. Harrison contributes the eleventh of his comprehensive articles on the "Moths of the subfamily *Bistoninae*."

In the *Ent. Mo. Mag.* for September, Dr. Chapman describes a curious instance of a "double pupal skin" in a chrysalis of *Pieris brassicae*, and contributes a plate with figures of portions of the two cases; Dr. Perkins discusses the Biology of the uncommon bee *Andrena bucephala* and its very local parasite *Nomada bucephalae*, from Devonshire; Mr. R. S. Bagnall describes a new species of Cynipid from County Durham, *Aylax taraxaci*, hitherto only found in Central Europe and N. America; Mr. E. E. Green continues his "Observation on British *Coccidae*," and describes the new species *Lecanium zebrinum* and *L. transvittatum*, both from birch at Camberley, *Lecanopsis butleri*, from grass at Royston; and the new sub-sp. *crudum* of *Lecanium persicae*.

The *Scottish Naturalist* for September contains a very useful article by L. H. Hine, "Some Notes on Microscopical Preparation of Insects," given in eleven pages of practical detail.

In the *Bull. Soc. ent. France* for July Dr. Villeneuve announces a teratological example of the Dipteron, *Trixa oestroidea*, in which the head is that of a female but the genitalia are those of a male, and he refers to the *Feuille des Jeunes Naturalistes*, 1912, pp. 111-113 where he has collected records of similar examples, stated to be not infrequent in the Diptera; Dr. Verity contributes notes on "Some Races of *Zygaena* in Sicily and Calabria," describing a new form of *Z. lonicerae* under the name of *trinacria* from Lupo, south of Palermo; and M. R. Decary gives a list of the times of emergence of various species of Lepidoptera in addition to species in several previous lists of records which he mentions.

Three Papers on Hymenoptera have recently come to us from the "Proceedings of the United States National Museum." (1) A Revision of the Hymenopterous Insects of the Tribe *Cremastini* of America N. of Mexico. (2) New Species of reared Ichneumon flies, etc., and (3) Notes and Descriptions of Miscellaneous Chalcid-flies, with (4) N. American Collembolous Insects of the subfamily *Onychiurinae*, the last with several plates.

In the *Canadian Ent.* for September H. B. Weiss gives a somewhat facetious account of the "Undesirable Insect Immigration into New Jersey," giving details of the arrival of the Mole Cricket, *Gryllotalpa gryllotalpa*, the Large Cockroach, *Blaberus discoidalis*, the Hemipteron, *Stephanitis pyrioides* on the azalea, and the tropical Weevil, *Cholus forbesii* on orchid bulbs; F. A. Fenton, studies on the Life-histories of two soft scale insect pests, *Lecanium corni* and *Physokermes piceae*, with two plates, the former known as the "plum scale," attacking a large number of trees, and the latter attacking the spruce, *Picea al*; and W. J. Chamberlain contributes an "Annotated List of the Scolytid Beetles of Oregon."

Dr. Chapman contributes two papers to the October number of the *Ent. Mo. Mag.* (1) Injury to a Pupa and Malformation of the resultant Imago, and (2) Notes on the Larvæ of Sawflies, *Rhadinoceraca micans* and *Phymatocera aterrima*, with several plates of figures; Mr. R. S. Bagnall announces another Cynipid new to Britain, *Aylax rogenhoferi* from near Sunderland.

The "Daily Mail" recently contained the following paragraph.

"Rare Butterflies in Flocks.—A remarkable spectacle may b seen now in County Roscommon, and indeed, throughout Centra Ireland, where myriads of rare and beautiful lepidoptera are disportin themselves. The lovely peacock butterfly is the most numerous, an clusters of this species may be seen on a single plant. They can b taken in the hand or plucked like fruit from a tree. The swallow-tai red-admiral, painted-lady, and many other varieties are here in profusion. It is a record occasion for collectors."

The comment of the *Irish Naturalist* on the above is this, "Such enlightenment on an expected addition to the Irish fauna will doubtless be received by naturalists in this country with the docility due to the universal knowledge possessed by all writers in our daily contemporary."

The 47th Annual Report of the Entomological Society of Ontario, 1916, consists of 174 pages and numerous illustrations. It contains a summary of the work of the Society and its three branches at Montreal, Toronto and in Nova Scotia, with a series of Special Reports on Insects of the Year, which have been locally injurious to agricultural or forest produce. These are succeeded by a series of papers read at the meetings during the year or at the Annual Congress held in 1916 at Guelph. "The Naturalist in the City," by that veteran the Rev. T. W. Fyles, D.C.L. "Dusting Fruit Trees and Grapes for the Control of Diseases and Biting Insects," by L. Caesar. "The Use of Repellants for Horn and Stable Flies on Cattle," by A. W. Baker. "The Relation of Insects to Disease in Man and Animals," by Dr. L. O. Howard; this was illustrated with lantern slides and dealt with, (1) insects as simple carriers of disease, (2) as direct inoculators of disease, (3) as essentially hosts of pathogenic organisms. "The Wood of Desire," by F. J. A. Morris, a charmingly written account of a visit in September to a beautiful forest district near Peterborough (Ont.) in search of insects. "Insects as Material for Studies in Heredity," by Prof. W. Lockhead, is a brief summary of what has been attempted in recent years with a short list of the literature of the subject. "A Historical Account of the Forest Tent-caterpillar (*Malacosoma* sps.) and the Fall Web-worm (*Hyphantria* sp.) in N. America," by A. B. Baird. Several papers on the Apple Maggot, Locusts, Forest and Shade Tree Insects, Various imported Greenhouse Pests, The Poplar and Willow Borer (*Cryptorhynchus lapathi*), etc., and their various suggested controls are followed by the Year's Entomological Record of Literature and Captures of Note.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

July 26*th*.—ANNOUNCEMENT.—The *Proceedings* for 1916-17 were announced as ready for issue.

VARIATION IN S. IRRORELLA.—Mr. Ashdown exhibited a series of the pale and dark races of *Setina irrorella* from Mickleham Downs, and living larvæ, pupæ, and imagines of *Anisosticta* 19-*punctata* from Surrey.

THE METHOD OF REARING D. MARGINALIS.—Mr. H. Main, a pupation chamber of *Dytiscus marginalis* with pupa *in situ*, and several chrysalids of *Vanessa io*, most of which had gold markings.

EXOTIC HESPERIIDÆ EXHIBITED.—Mr. Edwards, various exotic species of *Hesperiidae*, and read a note on the distribution of the family.

EXHIBIT OF NEW FOREST HYMENOPTERA.—Mr. West (Greenwich), a number of *Vespidae*, *Ichneumonidae*, and *Chrysididae*, taken by him recently in the New Forest.

A NEW ABERRATION OF A. CYDIPPE.—Mr. Hy. J. Turner, a specimen of *Argynnis cydippe* (*adippe*) with silver points in several of the large black spots on the under surface, a phase of aberration not previously known to him.

Abundance of Pierids, etc.—Attention was called to the swarms of the three common species of "whites" which had appeared in many places recently. *Polygonia c-album*, *Celastrina argiolus* (2nd brood), and *Calymnia trapezina* were also reported as abundant locally.

August 9th.—Election of new Member.—Rev. H. A. Soames, M.A., F.Z.S., "Lyncroft," Bromley, Kent, was elected a member.

New Forest Diptera.—Mr. Ashdown exhibited *Tipula gigantea* from the New Forest, and the Tachinid *Echinomyia grossa* from the same place.

Exotic Hesperiidæ.—Mr. Edwards, a living pupa of the stag-beetle, *Lucanus cervus*, taken by Miss Chauvin at Blackheath, and specimens typical of the groups of exotic *Hesperiidae*.

Details in the Life-histories of C. lunaris and G. ochracea.—Mr. Hugh Main, a food-mass of *Copris lunaris* (Coleoptera) containing a nearly full fed larva, and living larvæ and pupæ of *Gortyna ochracea* in stems of thistles, and pointed out that the exit arranged for the emergence of the imago was closed by a thin "door" of epidermis.

A case of irregular union, and an aberration of A. populi.—Mr. Turner, a very light grey aberration of *Amorpha populi*, bred from the egg, and two males of *Hyponomeuta euonymella* (*cagnagellus*) united with one female.

An aberration of A. cydippe (adippe).—Mr. B. Adkin, an aberration of *Argynnis cydippe* (*adippe*) from Kent, in which there were silver dots in some of the black blotches on the underside forewings.

Another case of irregular union.—Mr. Brooks reported an abnormal pairing of *Ptychopoda aversata* ♀ and *Camptogramma bilineata* ♂.

Seasonal Notes.—It was generally noted that the three species of *Pieris* were almost everywhere in considerable abundance. *Vanessa io* was also locally abundant and *Eugonia polychloros* had been seen about 20 miles from London.

August 23rd.—Decease of a member.—The decease of Mr. A. C. Vine, of Brighton, a member since 1889, was announced.

Aberrations of British Butterflies.—Mr. Frohawk exhibited the following aberrations of British butterflies. *Cupido minimus*, with jet black streaks on the upper surface of the left hindwing; *Agriades coridon*, a female with thin bright blue streaks on right hindwing; another female an abnormal asymmetrical underside, R. side 21mm. in expanse, unusually pale ground of hindwing and abnormal markings on both wings, L. side 18mm. in expanse, of normal colour and markings; *Adopaea flava* (*linea*) three males, 1, straw yellow, 2, washed silver-bronze, 3, rich coloured bred example; *A. lineola*, 1, pale ochreous, 2, broad dark margins and generally dusky.

Exotic butterflies.—Mr. Edwards, exotic butterflies, a *Neptis venilia* collected by Wallace, *Mycalesis nicotia*, *M. lepsha*, and *Abisara neophron* from Burmah, with *Limnas jarbus*, and *Smyrna blomfildia* from Bogota.

Second brood of A. populi.—Mr. Gibb, on behalf of Mr. Jaeger, specimens of a second brood of *Amorpha populi* bred in confinement.

Satyrids in Hertfordshire.—Mr. H. Moore reported that he had found *Pararge megera* numerous and generally distributed in Herts this year and had also seen *P. aegeria* in the county, both species of the second brood.

Editorial.

We have much pleasure in announcing that Mr. John Hartley Durrant has kindly consented to join our Editorial Staff.

It is a special pleasure to know that we shall hereafter have the advantage of his most valuable assistance. His knowledge of the Micro-lepidoptera of the world is very probably unique, whilst his assistance in Economic Entomology has been of the greatest value to the country, and not the least to our soldiers at the front. Again, his Bibliographical knowledge, and with it the whole Nomenclatorial question, will be of the utmost value to the magazine, so that we feel that our supporters will congratulate themselves on the advent of Mr. Durrant as an Editor of this journal, whilst we of the staff welcome him very heartily, he is a very old friend to some of us.

Notes on Agriades coridon, Poda and A. aragonensis, Verity.

By ORAZIO QUERCI.

During the first years of my entomological collecting, from 1885 to 1898, I collected Lepidoptera in the province of Rome without ever seeing specimens of *Agriades coridon*. In the month of August 1899 I found this species both at the Baths of Lucca, in Tuscany, as well as in the neighbourhood of Bologna, and in the following August, 1900, I found it again at Brunate near the Lake of Como.

From 1902 to 1910 I collected Lepidoptera on the mountains of Basilicata, and in the country near Naples without ever seeing *A. coridon*; only in August 1910 and 1911 I caught it in abundance on the Mainarde mountains in the province of Caserta.

In the months of August 1912 and 1913 my wife and daughter captured long series of small *A. coridon* in the high mass of the Sibillini mountains in the province of Macerata. These were absolutely identical with those which they had previously found on the Mainarde mountains.

I concluded therefore that *A. coridon* was an exclusively summer butterfly and was much surprised when I saw at Geneva in Switzerland, in the collections of Dr. Reverdin and Prof. Blachier, some fine series of *A. coridon* captured in April at Pardigon in the department of the Var (France).

In 1914 I came to Florence and found in the Verity collection some vernal specimens of *A. coridon*. Dr. Verity explained to me that on the hills round Florence *A. coridon* has two distinct generations. He added that on Mount Fanna, 650 metres above Fiesole, he had taken first in August and then in September two forms, which, though flying in the same locality, appeared so different as to seem individuals of two distinct species.

In the spring of 1914, my family went to explore systematically Mount Morello, about eleven kilometres distant from Florence, quite certain of finding *A. coridon* of the vernal season, but instead they did not see a single one in the spring, and it was only in the month of August that they were able to capture a fine and resplendent series of *A. coridon*, differing not only from the Mainarde and Sibillini specimens, but also from those which Dr. Verity had collected in the

Pian di Mugnone, a low region distant only six kilometres from Mount Morello, and being on the contrary, quite similar to those collected by him in August on Mount Fanna.

In the succeeding year 1915, my wife and my daughter, hunting every day in the Pian di Mugnone to establish the dates of the emergence of all the Florentine butterflies, we were able to form numerous series of *A. coridon* of the vernal season. Afterwards they went to hunt on the Pratofiorito mountain, above the Baths of Lucca, whilst I continued to search in Pian di Mugnone and collected a small series of the summer *A. coridon*.

On the Pratofiorito mountain *A. coridon* was found in a form rather like the one of Mount Morello, but absolutely different from the summer form I was hunting in Pian di Mugnone.

In the winter of 1915, Dr. Verity, having at his disposal an immense series of *A. coridon* of the Sibillini mountains, of Mount Morello, of the Pian di Mugnone, of Pratofiorito and other localities, undertook the study of the phylogenetic characteristics and discovered that certain characteristics common to nearly all the specimens of the Pian di Mugnone were wanting in those of other localities and *vice-versa*.

One night, tired out by the work of analysis, in which I was helping, we began to talk about the *Agriades*, with which we had been occupied for more than two months. At a certain point Dr. Verity, taking the few specimens collected by him on the Mount Fanna and comparing them with the specimens from other localities, said to me: "The mountain *A. coridon* has one generation only, that of the plain has two. On Mount Fanna the form of the plain is found in spring and in *late summer* while the mountain form is found at the *beginning of summer*, therefore there are two quite distinct species."

Surprised and fascinated by the discovery of my young master, I had to confess that there was nothing to say against his reasoning although the two species appeared almost identical.

In the article published in Vol. lxxxiv—year 1915—page 514 of the "Annales de la Société Entomologique de France," Dr. Verity indicates the specific differences, which now appear to me so evident that I am surprised that the specific double form of the two *Agriades*, confused under the name of *A. coridon*, was not recognised sooner.

I thought it right that Dr. Verity should name the new species discovered by him as *florentina*, but he made me observe that the Italian form with two generations was specifically identical with the Spanish form called *arragonensis* by Gerhard, and he decided to keep this name for the entire species, notwithstanding the error in orthography. He wrote in fact *arragonensis*, and I, having copied his manuscript for the press, have always written the name with double *r*, and I dont understand how it came to be printed with one *r* only, thus giving rise to inconveniences which Dr. Chapman has recently deplored, because the name of *aragonensis*, being no more identical with the first, has remained fixed for ever in literature and can never be substituted by another more appropriate, thus giving rise to confusion with the preceding name of *arragonensis*. (NOTE. *See page 256.*)

Though convinced of the specific double form, I wished, not being able to undertake the breeding from the larva, to obtain biological facts from field experience, so precise as to acquire absolute certainty, I wished in fact, to see the two species flying together and to distinguish them on the wing.

In 1916 I could not count on the able co-operation of my wife and daughter because they went in May to the Isle of Elba and remained there till the end of September. The excursion to Mount Fanna, where Dr. Verity found the two species together, is very fatiguing, so I thought I could carry out my intention by going in August to collect in the Pian di Mugnone, which is just under Mount Fanna from which it is distant, as the bee flies, not more than three kilometres, with a difference of level of about 500 metres. According to the data of Dr. Verity concerning the time of appearance, I ought to have found also in the Pian di Mugnone, on the first days of August, *A. coridon* and afterwards *A. aragonensis.*

On August 6th, 1916, I went accordingly to Pian di Mugnone, persuaded that I should find *A. coridon* in complete emergence, but a delusion awaited me because both on that and the following days I only captured *A. aragonensis.* On August 18th, the coppice, where the species usually flies, was destroyed by a fire, and being tired and weak in health, I had to interrupt my researches and to go to my family in the Isle of Elba to recruit.

This failure only increased my desire to succeed, and to accomplish a work of some scientific interest, we undertook in 1917 the entomological exploration of the Mount Fanna, in comparison with that of Pian di Mugnone which, notwithstanding the fire of the year before, promised well.

The males of *A. aragonensis* emerged this year on the Pian di Mugnone on May 25th, whilst the year before, in much more favourable climatic condition, they had appeared on the 12th of the same month. The females, which the preceding year had appeared on May 21st, were delayed till the 31st of the same month.

To make it clearer I have summarised as follows the *data* concerning the emergence of *A. coridon* and *A. aragonensis* in all the localities systematically explored by us.

At the end of the month of June, 1917, as the continual ascents of Mount Fanna had a good deal fatigued my young daughter she went with her mother to the mountains of the Romagna where the entomological hunts are easier than on the Fanna. Thus I remained alone at Florence and I decided to continue the comparative researches on the Fanna and Pian di Mugnone.

On Mount Fanna I captured the first males and the first females of *A. coridon* on July 29th, 1917, whilst at Mugnone valley the second generation of *A. aragonensis* emerged only on the 5th of August and a female on the 7th of the same month. In the first decade of August *A. coridon* was abundant on the Fanna. From the 18th of August till the 16th of September the *A. aragonensis* emerged in great quantities in the Mugnone valley.

The differences of the two species were evident in the living butterflies. The summer form of *A. aragonensis* of the Mugnone seen in flight seems quite like a white butterfly, and I have often found one in my net when I thought I had taken a *Leptosia sinapis.* When at rest on the stems it has instead a dark appearance; it seems identical with *A. thetis*, Rott., with which it is mixed. It is impossible to distinguish a male of the summer *A. aragonensis* from a male of the summer *A.*

Dates of appearance of *A. coridon* and *A. aragonensis* in the localities in which systematic collecting has been carried out by the Querci family.

Locality of capture.	*A. coridon*, Poda.	*A. aragonensis*, Vrty.	
Villa Latina (Caserta).—Campania. S. Italy. Mass of Mainarde mountains. m. 450.	race *sibyllina*, Vrty. ♂ ♂ 1-viii. to 15-viii., 1911. ♀ ♀ 1-viii. to 15-viii., 1911.	Absent.	Absent.
Bolognola (Macerata).—Marche. Central Italy. Mass of Sibillini. m. 1200.	race *sibyllina*. Vrty. ♂ ♂ 1-viii. to 20-viii., 1913. ♀ ♀ 1-viii. to 20-viii., 1913.	Absent.	Absent.
Fontebuona (Firenze), Tuscany. Central Italy. Mass of Morello. m. 400.	race *apennina*, Z. ♂ ♂ 1-viii. to 15-viii., 1914. ♀ ♀ 1-viii. to 15-viii., 1914.	Absent.	Absent.
Montefegatesi (Lucca), Tuscany. Central Italy. Mass of Pratofiorito. m. 700.	race *superapennina*, Vrty. ♂ ♂ 27-vii. to 15-viii., 1915. ♀ ♀ 27-vii. to 15-viii., 1915.	Absent.	Absent.
Palazzuolo (Firenze), Tuscany. Central Italy. Apennines of Romagna. m. 700.	race *superapennina*, Vrty. ♂ ♂ 18-vii. to 20-viii., 1917. ♀ ♀ 20-vii, to 20-viii., 1917.	Absent.	Absent.
Monte Fanna (Firenze). Tuscany. Central Italy. Mass of Fiesole. m. 650.	race *apennina*, Z. ♂ ♂ 29-vii. to 24-viii., 1917. ♀ ♀ 29-vii. to 24-viii., 1917.	race *florentina*, Vrty. ♂ ♂ 1-vi. to 1-vii., 1917. ♀ ♀ 3-vi. to 15-vii., 1917.	gen. aest. *altera*, Vrty. ♂ ♂ 19-viii. to 10-ix., 1917. ♀ ♀ 29-viii. to 20-ix., 1917.
Pian di Mugnone (Firenze), **Tuscany. Central Italy. Hills**	**Absent.**	race *florentina*, Vrty. ♂ ♂ **25-v. to 16-vi., 1917.** **♀ ♀ 31-v. to 21-vi., 1917.**	gen. aest. *altera*, Vrty. ♂ ♂ **5-viii. to 15-ix., 1917.** **♀ ♀ 17-viii. to 1-x., 1917.**

thetis when the wings are tightly closed and the fine blue of *A. thetis* is not seen. On the Fanna instead the confusion between *A. coridon* and *A. thetis* is not possible because the underside of *A. thetis* remains dark while that of *A. coridon* acquires a white appearance in the sunshine. On the wing, of course, *A. coridon* is distinctly of a light and delicate blue tinge.

Whilst I was making an abundant collection of *A. coridon* at the Fanna and of *A. aragonensis* race *altera*, at the Mugnone, my family were sending me every day from Palazzuolo di Romagna, (700m.) great quantities of *A. coridon* nearly identical with those I was taking on the Fanna.

On the 19th of August, 1917, I arrived at Mount Fanna towards evening when all the butterflies were at rest, and I went over the region examining all the bushes where *A. thetis* and *A. coridon* were settled on the stems. Most of the specimens were already spoilt, except a few perfect individuals which had emerged very late in the season. At a certain spot I accidentally knocked a bush with my net making a lot of *Lycaenidae* fly up. The sun, hidden by a small cloud, was on the point of setting behind Monte Morello, but, at the spot where the butterflies had flown up in a swarm, a ray of sunlight fell on the fugitives and allowed me to see the sight I had wished for two years: a freshly emerged male of *A. aragonensis* was in the group and contrasted strikingly with a fresh male of *A. coridon* flying near him.

At this moment, the *A. coridon* and the *A. aragonensis* captured together on the Fanna on the 19th of August, 1917, are before my eyes in all the stiffness of prepared specimens; then, in that wonderful sunset, I remained long in contemplation of them in my net, as soon as killed, very happy to have at last the proof of the surprising discovery of my dear master, Dr. Verity.

To my practised eyes the specific differences appeared plainly: 1st, the shape of the wings, pointed and lengthened in *A. coridon*, larger, shorter and more convex at the point in *A. aragonensis*; 2nd, the colouring of the upperside, of a fine electric blue in *A. coridon* whilst in *A. aragonensis* it tends to silver grey with greenish reflections; 3rd, the black spots of the underside of the wings in *A. coridon* are rather faint, especially those which form the antemarginal crown, whilst in *A. aragonensis* they are strongly marked and in the antemargin of the underside of the forewings they run into each other so as to form a black line, almost uninterrupted, parallel to the margin; 4th, the colouring of the underside of the hindwings, which is of a light tawny colour in *A. coridon* and brown in *A. aragonensis*; 5th, the want of any trace of the black discoidal spot on the upperside in *A. coridon* and the presence of the little black discoidal spot in nearly all the *A. aragonensis*.

I consider this last characteristic, which Dr. Reverdin had already remarked in most of *Agriades aragonensis* race *constanti* of Pardigon ("Bulletin de la Société lépidoptérologique de Genève," vol. ii., page 19), of decisive importance for the identification and separation of the two species. I have before my eyes 55 males of the summer *A. aragonensis* from the Fanna and I see that the discoidal spot is faint in only 8 of them, whilst in 195 males of *A. coridon* taken this year on the Fanna and at Palazzuolo di Romagna the discoidal spot is visible in only one which was taken on the 30th July, 1917, at Palazzuolo.

The differentiation of the females is very difficult to describe. I can recognise them at first sight, but it took me two years to arrive at this point. I consider it useless to allude to the distinctive characteristics because any description would be inadequate. What is required is a good set of figures or, better still, good material for comparison.

This difficulty need occasion no surprise considering that there are many entomologists, myself included, who meet with equal difficulty in distinguishing with certainty the female of *A. aragonensis* (which nearly all still mistake for *A. coridon*) from that of *A. thetis*.

After the 19th of August the *A. coridon* appeared to be in complete decadence, torn and discoloured; *A. aragonensis* instead was in full emergence, so that in a short excursion to the Fanna, on the evening of 10th of September I was able to capture, in half an hour, 12 males and 7 females, quite fresh, leaving aside a great quantity of other *A. aragonensis* which were very slightly damaged.

On the 20th of September, 1917, perhaps on account of the persistent fine weather of this autumn, the *A. coridon* were still flying but very ragged. Still they were always to be distinguished from the *A. aragonensis* even when spoilt; the fine blue of the few scales which remained on the stumps of the wings of *A. coridon* were always in notable contrast to the silvery scales of the male *A. aragonensis*.

SCIENTIFIC NOTES AND OBSERVATIONS.

Flying habits of Butterflies when paired.—On July 17th, 1917, I paid a visit to Ramnor Enclosure, in the New Forest. It was a very warm and oppressive morning, with the sun partially obscured. I disturbed 2 pairs of *Dryas paphia* and in each case the ♂ carried the ♀ when in flight. I disturbed them a number of times with the same result. I thought that possibly the absence of bright sunshine might have had effect on the ♀, but later in the morning the sun shone brilliantly, and I came across another pair, but again the ♂ carried the ♀.

On August 10th, 1917, I paid another visit to the New Forest. *D. paphia* was now going over, but I observed a ♀ carrying the ♂. The latter was somewhat worn and chipped. I made a number of observations on the species which I give below, but so far *D. paphia* is the only species that varies from what looks like a fairly fixed rule.

July 17th, 1917.	2	♀	*Epinephile*	*jurtina*	carrying	♂
,, ,, ,,		♂	*Pieris*	*napi*	,,	♀
June 11th, 1917.		♂	*Pieris*	*brassicae*	,,	♀
July 20th, 1917.		♂	*Plebeius*	*aegon*	,,	♀
August 5th, 1917.		♂	*Pieris*	*brassicae*	,,	♀
August 7th, 1917.	2	♂	*Pieris*	*rapae*	,,	♀
,, ,, ,,		♂	*Pieris*	*brassicae*	,,	♀
,, ,, ,,		♀	*Pararge*	*megera*	,,	♂
August 10th, 1917.		♂	*Polyommatus*	*icarus*	,,	♀
August 15th, 1917.		♀	*Hipparchia*	*semele*	,,	♂
,, ,, ,,		♀	*Pararge*	*megera*	,,	♂
August 18th, 1917.		♀	*Hipparchia*	*semele*	,,	♂
,, ,, ,,		♀	*Pararge*	*megera*	,,	♂
,, ,, ,,		♂	*Pieris*	*brassicae*	,,	♀

—C. W. Colthrup.

Melanism in the Orthoptera.—At Boulder, Colorado, the large grasshopper *Melanoplus differentialis*, Uhler, presents a melanic phase which may be called var. *nigricans*. The insect is nearly all black; but the antennæ are reddish (pale on inner side), the hind femora have two large yellow patches above, smaller ones on the outer side, and are mainly yellow on inner and lower surfaces, the hind tibiæ have a broad ring of yellow near the base, and the anterior and middle femora are completely ringed with yellow. The type of *nigricans* (male) was taken by W. P. Cockerell at Boulder, August 24th, on a leaf of *Helianthus annuus* var. *coronatus*. This melanic form occurs in both sexes; I have found a normal male united with a melanic female. The normal and melanic phases are evidently alternative in inheritance, and are quite clear-cut in their distinctions. I do not recall any other such case among grasshoppers.—T.D.A. Cockerell, Boulder, Colorado.

NOTES ON COLLECTING, Etc.

Pieris brassicæ and P. rapæ and an Ichneumon.—Both species have been in abnormal numbers wherever I have been in Kent, Surrey, Sussex, Hants, and Dorset this year. At Brighton and Eastbourne whole fields of what should have been cabbages contained nothing but stalks and veins of leaves. What, however, was more noticeable than the depredations of the larvæ, was the number of bunches of yellow cocoons of *Apanteles glomeratus*, fixed to walls, fences, etc. At a laundry in Eastbourne, the side of the house, the engine house and the stables were dotted all over with the yellow cocoons, and I failed to discover a single Pierid pupa. They were equally abundant at Brighton, Poole, Bournemouth, Petworth, Midhurst, Guildford, Leatherhead, and other places that I visited, and in my garden at East Dulwich they were also present.

I was able to put a number of people right with regard to these cocoons, which they took to be the eggs of the white butterfly. It was not so easy to point out the pupa of the butterfly, as it was usually a difficult matter to find one. I was very much surprised to find that men, who had been gardening in a fairly large way for a number of years, were more or less ignorant as to their insect friends and foes, and on one occasion in the spring, when I was watching with delight the graceful movements of a pair of Willow Warblers, just arrived after migration, clearing insects off some currant bushes, I was much surprised to hear my friend say that he was going for his gun to shoot them, as he was quite sure they did a lot of harm to the fruit, and I had some difficulty in assuring him to the contrary.—C. W. Colthrup.

Colias edusa in 1917.—I heard in June that immigrants had been seen near Petworth, in Sussex. On August 18th I saw my first specimen, a freshly emerged female, at Swanage, in Dorset, just outside the town, feeding on a hawkweed flower, but by the time I got my net up it had disappeared over the cliff. Later in the afternoon I saw another specimen careering madly along with the wind and quite impossible of capture.

On the 19th I took two females in a field near Bournemouth feeding on hawkweed flowers, both freshly emerged, and missed another female.

On the 20th I went to the same field, where the species was apparently emerging, and took two males and a female, all in splendid condition.

On the 22nd I left Bournemouth for a few days in the Isle of Wight, where I observed *C. edusa* in some numbers flying on the railway banks between Newport and Ryde. My observations were then cut short by heavy rains and gales, which lasted for three days. Much damage was done to fruit trees, and many large trees and branches were blown down.

On August 31st there was a strong south-west wind at Bournemouth, and I only saw one male *C. edusa* flying strongly down wind.

On September 3rd I saw three freshly emerged females feeding on hawkweed, but did not have a chance to net them, as they were very wary, and as they rose were carried away by the strong south-west wind. I managed, however, to net a male freshly emerged. Contrary to previous experience, the females outnumbered the males.

The sun was not seen again until the 7th when it put in an appearance in the afternoon, but in the morning I saw a male flying and feeding on the railway bank at New Milton, in fairly dull weather. This is the only occasion on which I have seen the species on the wing when sunshine has been absent. Hunger was no doubt the reason, after a four days' fast. I went to the emerging field in the afternoon, but though the sun was now shining brilliantly no *edusa* were flying, but I was fortunate in walking up a freshly emerged male, with the black bands of the wings covered with yellow scales, and on the underside of the hindwing the two silvery discal spots with chocolate coloured borders were very nicely radiated, the variety being very similar to the one I took of *C. hyale* in 1911.

The morning of the 8th was perfect, with a cloudless sky, a warm sun, and not a breath of wind. It was the only perfect day we had had since *C. edusa* was out, and when there was not half a gale blowing, so I was out betimes, and in high spirits, on my way to the emerging field, which was about 100 yards square.

On arriving in sight of the field great was my disgust to find a squadron of Royal Engineers feeding their horses over it, and they quartered it very thoroughly, so that those insects emerging that were not eaten were probably trampled to death. It was most annoying because while I had permission from the owner to work the field, the army had not, as the owner was expecting to cut a second crop in the near future, and it was the only likely field in the neighbourhood, the others being well farmed. However, I had to make the best of it, so sat down and had an interesting chat with the men. I got no more *C. edusa* from that field during my stay. My troubles were not over for that morning, however. On my way back over a small piece of rough ground, I saw two *C. edusa* wandering from flower to flower, and was making for one of them when from behind a gorse bush appeared six small boys from a local college, armed with nets, and seeing what I was after they charged down with a war-whoop to "help" me. I had just time to see that the insect I was after was a well-marked female, which they succeeded in scaring so much that it went away for all it was worth, the other one did likewise, but in a weak moment it stopped to sip at a flower, and in that moment one of the boys got his net over it, and the next was racing to me with the insect, a female, between his finger and thumb. Great was his disgust to find it was no longer of any use to me, and he was no better pleased when, in transferring it to his killing bottle, the insect managed to escape. However, to make amends he soon got another "female" under his net, which he offered to me, but it proved to be a male. This boy was very keen, and I saw a good deal of him afterwards when he brought all kinds of things to be named, and I hope will later on be a valuable recruit to our hobby.

On September 10th I went to Eastbourne for a few days, and although I had no time for entomology I managed on the 11th to box a worn, diminutive male specimen of *C. edusa* in a garden in the town, as it was feeding on a hawkweed flower.

On September 14th I was back at Bournemouth and netted a male underside var., very similar to the one I took on September 7th, but a little worn, and a specimen of var. *helice*, with one hindwing chipped, but otherwise in good condition. This was the only var. *helice* seen.

I did not see any more *C. edusa* until September 23rd, when at Bournemouth I saw two specimens flying swiftly with the south-west wind, near the edge of the cliff.

On September 24th *C. edusa* was flying on the railway banks at Bosham, Sussex.

On September 28th I took a male freshly emerged and another worn at Bournemouth, and the last specimen seen was flying along the sands on September 30th.—C. W. Colthrup.

My Diary Notes on Entomology in France, 1917.—The fortune of war has carried me to Boulogne, and although one never knows one's fate in war time, I write the following notes during the limited spare time I have, hoping that they may be of general interest:—

June 29th.—As in England, the spring butterflies are over, and I am too late for any cabinet specimens of *Melitaea cinxia*, which occurs freely in the Forêt de Boulogne, a few miles inland. To-day I have collected under a cloudy sky in the Vallée du Denacre, a short distance along to the right of the Rue de Calais, near Napoleon's Column. The Vallée du Denacre is reached from the old town of Boulogne (that part within the old ramparts, including the old cathedral), by way of the Rue de Lille, the Porte de Calais, and Rue de Calais. On any day except a Sunday this valley is generally undisturbed. To-day *Epinephele jurtina* (*janira*) was flying quite fresh in the still uncut hay fields, and I was pleased to find a brown speckled plume moth unfamiliar to me in England, together with an interesting assortment of Coleoptera and Diptera. Unfortunately, I believe the city museum is closed owing to the war, but if I can, I will get inside, as it will greatly help me to name insects of other orders than Lepidoptera. It takes one hour to reach the Vallée du Denacre on foot from the old town.

July 2nd.—The weather having greatly improved this afternoon, I tried a valley among the hills at the back of the town, which I shall describe more precisely if I find it really good. To-day I captured *Augiades sylvanus* in both sexes; *Coenonympha pamphilus*, going over; *E. jurtina*, the females quite fresh; a pair of *Aglais urticae*, who were courting at tea time; *Pyrameis atalanta*, quite fresh, though flying with hybernated "cousins"; and one *Pieris napi*, summer brood. The ground promises better things as the season advances.

July 6th.—I collected to-day in the same valley, but on lower ground, which slopes finally towards the river. The wind was strong, and therefore results less good, chiefly *P. napi*, *P. rapae*, *A. sylvanus*, *A. urticae*, *E. jurtina*, and a large dragonfly I cannot name, together with some interesting Diptera. The males of *Melanargia galathea* were fresh on the wing yesterday near here in the Forêt d'Hardelot, reached from here by tram.

July 10th.—I took the tram from Boulogne post office to Pont-de-Briques, thence by another tram to Pré Catalan, which is in the Forêt d'Hardelot. There is a restaurant at Pré Catalan. The woods being high up, insect life was not very abundant, but I put up a *Eugonia polychloros*, two *Argynnis aglaia* females, males and females of *Aphantopus hyperantus*, a female of *H. sylvanus*, males of *Adopaea flava* (*thaumas*), besides males and females of *Pieris rapae*; and *P. napi* was flying plentifully, together with the six-spot burnet moth *Zygaena filipendulae*. Dragonflies were more numerous than Lepidoptera, owing to the abundance of water in lakes, ponds, and rivers in the vicinity. The weather was sufficiently fine. I forgot to mention I saw one female of *Melanargia galathea* flying among the ferns, together with a few *Epinephele jurtina*. The *Lycaenidae* were entirely absent to-day. It is in this locality also, I understand, that *M. cinxia* occurs rather plentifully in the spring in the end of May and early June.

July 14th.—A very quiet "14th of July" to-day in France in war time. Last evening I went out with my net "dusking" after dinner, but the result was not great. I got a good *Habrosyne derasa*, a specimen of *Alucita pentadactyla*; *Eurrhypara urticata*, *Spilosoma lubricipeda*, besides seeing the "swallow-tail moth" *Ourapteryx sambucaria*, and the "brimstone moth" *Opisthograptis luteolata* on the wing.

July 17th.—To-day I took a tram, which leaves the Boulogne post office every half hour for Pont-de-Briques. After half-an-hour's run I reached the village, and crossing the railway I continued along the Hardelot Road for some distance, but taking the first fork to the left, I left the Hardelot Road and continued past some factories and mills until you see a level railway crossing on the left. Then, after crossing this, you take the path to the right, which is the commencement of a long stretch of collecting country, probably the best near Boulogne, parallel to the railway and the river, and between them. The day was hot, and suitable for collecting. Fresh *Aglais urticae* were out, also the males of the summer form of *Rumicia phlaeas*, a darker form than the prevailing one in England. *Epinephele tithonus*, males, fresh out, flitted along the bramble hedges, and by the river bank the dragonflies, *Calopteryx virgo*, the males with dark blue wings and the females with yellowish-green wings, added to the beauty of the scene. *Adopaea flava* (*thaumas*) is now abundant in the grassy patches which have escaped the reapers, and *P. rapae* and *P. napi* are swarming. After some miles walk I crossed the river, and continuing past a farm, gained a road to the left. Bearing back toward Pont-de-Briques on this road, and taking the first turn on the right, I regained the high road to S. Léonard. At this point, immediately across, I found a steep grassy bank below corn fields, where the males of *M. galathea* were in abundance, and very similar to our English form. *Augiades sylvanus*, and *A. flava* (*thaumas*) were frequent here. During this afternoon's expedition I probably covered the best ground for Lepidoptera nearest to Boulogne, which I shall certainly revisit if possible.

July 21st.—To-day, starting to collect on the same grassy bank where I found the males of *M. galathea* on the 17th inst., I had the pleasure to take a male of *Thymelicus acteon*, fresh out, and continuing along the corn and other fields which rise gradually towards the left, I came across the males of *Vanessa io* and *Pyrameis cardui*, freshly emerged, in small numbers. *E. tithonus* is now generally abundant along hedges.

July 22nd.—Collecting to-day on the same ground as on the 21st, but mounting higher among the many suitable fields towards the left, I took one *Papilio machaon* male just emerged. I saw one fine *Colias edusa* male in perfect condition. I also took one *V. io* male, a male and female of *P. brassicae* (summer brood) just emerged, and one more *Thymelicus acteon* male. The females of *E. tithonus* and *M. galathea* have just begun to emerge, and I took one of each, together with several males of the latter, in good condition. The weather to-day has been perfect throughout, and though I was unable to get on to the above ground until 4.30 true time, I noticed a considerable increase in insects on the wing.

July 23rd.—On the same ground as yesterday I found to-day that the males of *Hipparchia semele* are emerging, and I took three quite fresh, together with two more females of *M. galathea*, which are becoming more numerous. A fine day changed with late afternoon to a thundery aspect, which spoilt my chances, as I could not get on to the ground until 4.30 p.m.

July 24th.—The weather this afternoon was so appallingly hot that much active collecting was out of the question, but still I covered a considerable amount of the high ground beyond Pont-de-Briques, well to the left of the river. Fine specimens of the males and females of *H. semele* were to be taken to-day, and the males of the summer brood of *Celastrina argiolus* are out, and settle sometimes on a bramble blossom for want of something more congenial. Then the males of *Lasiocampa quercus* were very busy on the wing, and one which rather dawdled got into my net and stayed there. As I hadn't the pleasure of taking *H. circe* cleanly off tree trunks this year, I tried for a change the "drive" stroke at golf for taking up *H. semele* off the ground, which if carefully done meets with success, as they rise to it. The moths *Cabera pusaria* and *Botys ruralis* rose from the long grass to-day, the former in some numbers.

July 27th.—I collected later this afternoon along the high ground above the cliffs on the sea front towards Wimereaux. The males of *Polyommatus icarus* (summer brood) are now on the wing in small numbers, and I noticed *Pyrameis cardui* out fresh also in small numbers. One male *Argynnis cydippe* (*adippe*) showed that the species occurs here, but it was going over in condition, and therefore not worth taking. The weather is perfectly glorious, and if it continues I hope yet to add many names to my list of species observed here.

July 28th.—I collected to-day behind Boulogne in a valley to the left of the road which leads to Pont-de-Briques. I secured a pair of *P. icarus* (male and female) just out, also a male of *Thymelicus acteon*, in good condition. One or two *P. cardui* were about, but were already too ragged to take. I am surprised this species is not more plentiful, as the quantity of thistles and teazles in this district is very great. *Rumicia phlaeas*, too, is extraordinarily scarce at present. The three common *Pieridae* are swarming everywhere.

August 3rd.—It has rained all this week, which has driven me for my spare time to the Bibliothèque Publique in the Rue Marietta. Here I found an interesting book, "Les Papillons de l'Europe," par Johanny Martin, and published in 1905 by Schleicher Frères of Paris. I found this book absorbing, as now and then it gave instances of the distribution of butterflies, especially in France, which I thought had escaped our English works and magazines.

August 6th.—This afternoon was sufficiently warm to make collecting just possible, though the ground is still very sodden. I collected between Boulogne and Wimereaux, on the top of the cliffs between the main road and the railway, though there is little good ground, and you have to negotiate people and cattle. However, *P. icarus* (summer brood) and *Coenonympha pamphilus* (summer brood) were in full force in both sexes, and I got one perfect *P. cardui* on his feast of teazles. I also took one specimen of the "Golden Y" moth, *Plusia iota*, freshly emerged. I have also taken a couple of specimens of the moth *Strenia clathrata*.

August 8th.—To-day I took the tram to the old chateau of Hardelot, beyond Pont-de-Briques. I tried for the second brood of *Melitaea cinxia*, where the first brood occurs in May-June, by the ponds between the old chateau and Pré Catalan, but as the sky was overcast I saw nothing. From 3.0 p.m. to 7.0 p.m. we had a succession of six thunderstorms, between which I got a total of fifteen minutes actual collecting, when I took, beyond the Hotel at Pré Catalan, 12 *Brenthis selene*, second brood (7 males and 5 females), one *Plusia gamma*, and one *Catocala nupta* off a tree-trunk in perfect condition. I saw *Euvanessa antiopa* from the tram flying between Pont de Briques and the Chateau d'Hardelot, and I believe I should have done well to-day had I had a chance.

August 9th.—To-day I found a specimen of *Bryophila muralis* (*glandifera*) and a Noctuid moth on the trunk of a tree in the boulevards outside the ramparts of the old town of Boulogne.

August 10th.—This afternoon, collecting on the high ground on the left beyond S. Léonard, near Pont-des-Briques, I found the summer brood of *Pararge megera* fully out and quite abundant. Very little else was on the wing, and I fear the recent heavy rains have been very injurious to "insect life," as also to the crops.

August 16th.—To-day along the tram route from Pont-de-Briques, both before and after passing the Chateau d'Hardelot, I found the summer brood of *Aricia medon* (*astrarche*), both sexes, in good condition. Beyond the restaurant at Pré Catalan, on the road to the left, I found *Vanessa io*, *Aglais urticae*, *Pyrameis atalanta*, and *P. cardui* all in perfect condition, but not abundant. The day was too windy for a good bag, but I still found a few *B. selene*, second brood, worth keeping. I have ascertained that *Bithys* (*Thecla*) *quercûs* and *Limenitis sibilla* both occur in the Forêt d'Hardelot, though I have not yet made their acquaintance.

August 20th.—After a day of fine sunshine I was able to snatch the last hour of insect flight this afternoon on the high ground above S. Léonard to the left. I found *Pararge megera* on the wing abundantly in both sexes. *Abraxas grossulariata* was stirring quite commonly with some varieties, and I took a female of *P. icarus* finely "blued" on the upperwings. I have seen no signs of *Urbicola*

(Hesperia) comma or *Ruralis (Thecla) betulae*, both of which might reasonably occur, as I feel certain that there is a larger list of butterflies to be obtained in this district than I have yet been able to unravel.

August 23rd.—To-day, in the Forêt d'Hardelot, amidst high winds, spells of sunshine and showers, collecting was at a discount. However, I secured a fine specimen of *Gonepteryx rhamni* (male), and I saw a worn specimen of *Dryas paphia* (female), making two more species to add to my list as occurring in this district. I also secured three females of *P. megera* in good condition, and a fine specimen of *Aricia medon* (*astrarche*). These, with a couple of dragon-flies, were all I could get on an unfavourable day.

September 6th.—The weather has been so atrociously bad since my last entry that collecting has been brought to a standstill. However, to-day, in the Forêt d'Hardelot, by the Pré Catalan, during about an hour's sunshine, I found *Pyrameis atalanta* in some abundance; also for the first time here I found *Rumicia phlaeas* fresh, and in some numbers. They, together with the *P. atalanta* and a large number of dragon-flies, and *Pieris rapae* and *P. napi*, were settling on a mass of late flowers by a pond at the back of Pré Catalan behind the restaurant. I got here what I think is a variety of *Aglais urticae*, a number of Diptera, and one specimen each of the moths *Ennomos quercinaria* (*angularia*) and *Anaitis plagiata* completed the day's total. The leaves are coming off the trees in such abnormal numbers for the time of year that it is probably the earliest autumn we have had in this respect for many years, especially remarkable after a particularly late spring.

September 11th.—To-day, at Pré Catalan, there is every sign of the season drawing to its end. *P. atalanta* hangs on to the rapidly diminishing flowers in great numbers, accompanied by a considerable number of *A. urticae*. It is a remarkable fact that *G. rhamni* is nowhere to be seen here this year, except the one male I took on August 23rd. *Rumicia phlaeas* is quite numerous and I am looking for varieties. Dragonflies of many hues, which I hope to name next year, still swarm round the ponds near Pré Catalan in the warm September sunshine. Larvæ of *Phalera bucephela* are met with in the Forêt d'Hardelot on their walks across the roads, but the trees will soon be leafless. To-day a fresh specimen of *Colias edusa* was taken outside the Forêt de Boulogne, by a young French entomologist, who showed it to me. If I am spared, and am still stationed in this neighbourhood next year, I intend to work this Forêt (which is much larger than the Forêt d'Hardelot) throughout the season, though it is difficult to reach in war time, as the tram service is almost abolished.

September 17th.—To-day, at Pré Catalan, in dull, rainy weather, I boxed a specimen of *P. atalanta* apparently just emerged, and walking on to Hardelot I came across the spurge plant, *Euphorbia cyparissias*, on which I am told the larvæ of the "Spurge Hawk Moth" is to be found here in August. This plant is frequently met with on the sand dunes round Hardelot. The larva pupates in the sand below the foodplant, and I have got three chrysalides dug out from the sand. I hope to write more about this species and other matters next year.—E. B. Ashby (F.E.S.), Hounslow.

Lepidoptera of Guernsey in 1916.—Lepidoptera have been far from plentiful this year. From the 16th of June to nearly the end of July I spent most of my days at Pleinmont, and so was able to compare the insects of 1916 with those of 1915—in the same locality and at the same dates.

Without exception, I think, every species even the commonest, was less abundant this summer. The early mornings and evenings were very cold though the days were fine; the wind, generally from N.E., often high. In June there were many days of fog lasting till late afternoon. In August and September the weather was more favourable, but insect life had suffered from the exceptional drought during the feeding time of their larvæ. The military restrictions in the use of lights still remained a hindrance to night collecting. But notwithstanding drawbacks there are a few interesting captures to note, two species not hitherto recorded for Guernsey, and others of such rare occurrence in the island as to deserve mention.

My two new discoveries consist of one *Eupithecia*, and one *Noctua*. The former *Eupithecia subfulvata* was taken in the lane connecting the Castel Church with the Foulon on August 5th. It is generally reputed common in England.

The second novelty, *Erastria fasciata* (*fuscula*) was more of a surprise. I beat it out of a hawthorn hedge above, and a little to the west of Petit Bôt, on July 28th. This was rather a late date for this species, which is a somewhat local insect. I have taken it constantly in the New Forest and also on the continent, but always in woods, especially among fir trees. Its food plant, Purple Melic-grass (*Molinia cærulea*), is stated in Marquand's "Flora of Guernsey" to be rare, but "the cliffs towards Corbière" are mentioned as a locality where it grows.

Of things not new, but worthy of observation, *Euchloë cardamines*, arrived first. The specimen was taken in the fields of Beauséjour. The only other reported capture is one taken by the late Mr. Luff in 1893, at Grande Mare, in which year I also saw a specimen in the Ramée Road. As its food plants are abundant here, and the butterfly is widely spread and most common in England, it is somewhat strange that it should not be among our indigenous insects.

On July 14th I took a freshly emerged female of *Nola albula* at Les Tielles Forest. Only one other of this always rare moth has been taken in Guernsey, a male—which is also in my cabinet.

On August 30th, Mr. Frank Drake, of Monnaie de Haut, brought me a full-fed larva of *Notodonta ziczac* to identify. Mr. Luff and myself have each taken one specimen of the imago of this moth. These I believe are the only records. From the point of view of rarity, the most notable entomological event was the taking of *Leucania l-album* at sugar in my garden. We must travel back 45 years for a record of a visit to our island of this species. Mr. Luff took a specimen near Fermain Bay in 1871. I have said "a visit," because there is little doubt that specimens of this rarely taken insect, both in England and here, are immigrants from France. I have a series taken in Switzerland and France where it is common.

Another moth, the Geometer *Xanthorhoë* (*Melanippe*) *rivata*, appears to be very scarce here. I took two this summer in the Torteval lanes. Mr. Luff took two in 1874 at Fermain.

Three other insects reputed very scarce in Guernsey I found to be tolerably common when you know *where* and *when* to look for their larvæ. The larvæ of the pretty little lichen feeder, *Cleora lichenaria*, beat in some number from an old hedge when I was unconsciously trespassing on Mr. J. Bonamy Collings' ground, above his new house. The owners came upon me and courteously invited me to continue my hunt; in consequence I bred about 20 specimens of the moth. *Agrotis strigula* or "True lover's knot," is to be obtained easily in the pupal stage in mid-July—under the heather above Gull Rock—and near Pleinmont Point. On one occasion I got seven in less than an hour. The larvæ of *Dianthœcia conspersa* (*nana*), as well as *D. capsophila*, are to be had in some number by searching the sea campion on the cliffs, with larvæ of *Eupithecia venosata* and others.

This year I found one solitary larva of *Lasiocampa trifolii*, which, I had not seen for a very long time. It unfortunately escaped from the breeding cage a day or two later. I was more successful with our Guernsey form of *Dianthœcia barrettii* var. *lowei*, for I have bred a dozen fine specimens from pupæ obtained by hours of patient and exhausting labour.—(Rev.) Frank E. Lowe (F.E.S.), Guernsey.

Butterflies in North Yorks.—My experience with the Vanessids this year may be of interest. *Vanessa io* has occurred at Middlesbrough on two occasions, the first on September 16th, in a friend's garden, probably attracted to a flowering *Buddleia*, on which "whites" (which have been only too numerous for gardeners) and *Pyrameis atalanta* were disporting themselves; the other specimen was sitting on an empty plant box in the garden, in a very dazed condition, in the early morning of October 11th, after a cold frosty night; the sun coming out it was slowly moving its wings about, apparently trying to get up its circulation, something, probably a bird, had evidently had a bite at it when in a folded position, as it had an identical piece out of both wings. It is fully 30 years since I have seen this butterfly in the Middlesbrough district. *Vanessa io* was also noticed by me in early September, in Upper Swaledale, disporting itself on flowers of the wild mint, along with a number of *Aglais urticae* (and *Hydroecia nictitans*) which seemed to be quite abundant both here and in the adjoining dale of Wensleydale, reminding one more of what used to be 20 to 25 years ago. *A. urticae* also occurred at the *Buddleia* and *Sedum spectabile* flowers in my garden during September, along with numbers of the lovely *Pyrameis atalanta*.

Single specimens of *Pyrameis cardui* were noticed at Glaisdale on August 25th, and at Saltburn-by-the-Sea on September 12th.

A specimen of *Euvanessa antiopa* is recorded as being taken at sea off Tees mouth, on August 15th.

There appears to be no doubt that long severe winters are favourable to insect life, especially the butterflies, and a series of these would probably go a long way to re-establishing many species that have become very scarce in recent years.—T. Ashton Lofthouse, Linthorpe, Middlesbrough. *November* 10*th*, 1917.

Sphinx convolvuli in North Yorks.—Mr. Frank Elgie, Curator of the Middlesbrough Museum, informed me that he had had five speimens of this hawkmoth brought to him taken in this district during August and early September.—Id.

CURRENT NOTES AND SHORT NOTICES.

The following is a list of the Fellows of the Entomological Society of London nominated by the Council to hold office during the ensuing year—*President*, Dr. C. J. Gahan, M.A., D.Sc.; *Treasurer*, W. G. Sheldon; *Secretaries*, Comm. James J. Walker, R.N., M.A., F.L.S., Rev. George Wheeler, M.A., F.Z.S.; *Librarian*, George Charles Champion, F.Z.S., A.L.S.; *Other Members of Council*, A. W. Bacot, E. C. Bedwell, Kenneth J. Blair, Dr. T. A. Chapman, M.D., F.Z.S., W. C. Crawley, B.A., H. Willoughby Ellis, F.Z.S., Dr. H. Eltringham, M.A., D.Sc., F.Z.S., J. C. F. Fryer, M.A., A. H. Jones, Rev. F. D. Morice, M.A., S. A. Neave, M.A., B.Sc., F.Z.S., Herbert E. Page.

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We regret to note that Mr. Albert H. Jones, the genial treasurer of the Entomological Society of London for so many years, has been compelled to resign his office owing to continued ill-health for some months past. May he have a speedy recovery.

Note to page 242.—The author is mistaken. If the double-brooded form is eventually shown not to be co-specific with Gerhard's *arragonensis*, the name *aragonensis* not only *need* not, but *could* not stand; names so close to others already in existence as to be practically identical being disallowed, since they are really homonyms.—G.W.

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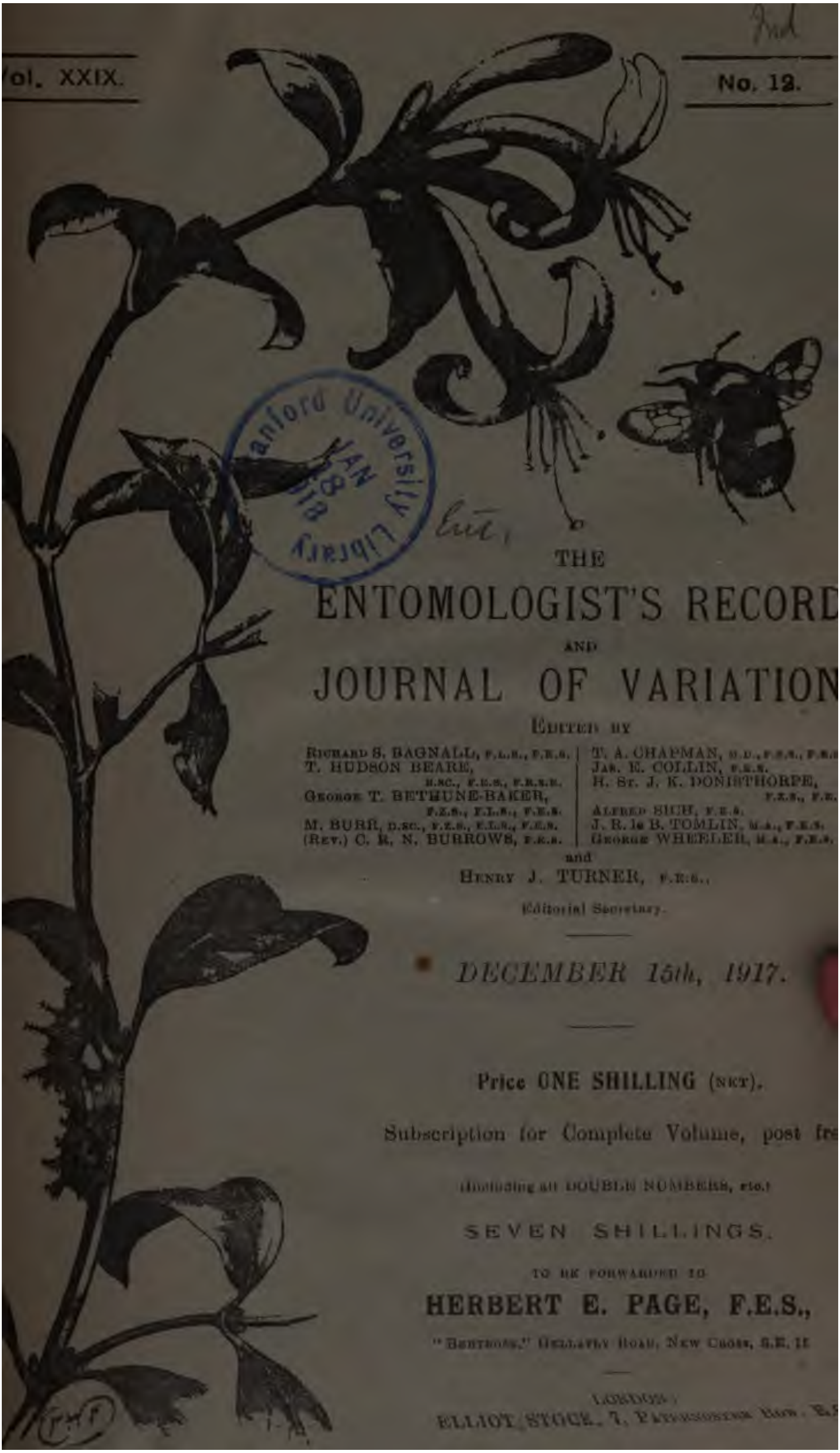

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